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FOREWORD TO VOLUME 54.

WHEN the author died in November 1947, he had completed his work and had even read much of the printer's proof. The last batch of galley and some 140 pages of page proof had still to be read; and page figures had to be entered against the names of species and varieties in the manuscript index which he had fortunately prepared. This task was entrusted to a friend, in accordance with his wish. A few adjustments were found necessary in the index, since it had evidently been compiled before the author had come to his final decision on the correct names of one or two species. Again, for the sake of precision, certain specific combinations which were apparently first made by Roffey in the Eleventh Edition of 'The London Catalogue of British Plants', and are treated only as synonyms in the present work, have now been attributed to Roffey in the index, although the author had omitted that name in his manuscript and it does not appear in the relevant places in the text. It also seemed desirable to add an index of the names of groups higher than that of species. Finally, a number of new combinations and two *nomina nova* have been cited, in accordance with the International Rules of Plant Nomenclature, from the place of their publication in the author's list of British species of *Hieracium*, which appeared as Appendix 2 to the 'Check List of British Vascular Plants', published in the 'Journal of Ecology', vol. xxxiii. no. 2, pp. 345-347 (1946). A few trivial emendations or additions of this kind are always needed in the final stages of the production of a big monograph. The work itself is entirely the author's own, as he left it; it has not been edited, but has simply been seen through the press by a friend.

Only the preface remained to be written. It is believed that the author would have wished to thank, above all, the Council of the Linnean Society of London for publishing his last and most considerable work; and the authorities of the Herbarium of the British Museum (Natural History) for the many facilities so readily granted for the use of specimens and books, both at South Kensington and during the war at Tring. He would also have thanked the authorities of the Royal Botanic Gardens, Kew, the South London Botanical Institute and the Department of Botany, University of Oxford, for permission to work in their Herbaria; and those of other institutions for the loan of specimens.

A PRODROMUS OF THE BRITISH HIERACIA.

By H. W. PUGSLEY, B.A.

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A PRODROMUS OF THE BRITISH HIERACIA.

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INTRODUCTION.

DURING the last decade of the nineteenth century several British botanists became interested in the Hawkweeds of these islands and endeavoured to extend our knowledge of the genus, which had remained almost stationary since the appearance of Backhouse's Monograph in 1856. The results of their work are summarized in three books published at the beginning of the present century. The first of these is a revision of the genus printed in 1902 and 1903 in parts 3 and 4 of the 'Prodrromus Florae Britannicae' of Frederic N. Williams. This is an original account, describing seventy-five species and numerous varieties, classified in Sections adopted from Elias Fries's 'Epicrisis Generis Hieraciorum', with many subdivisions that were new. Two years later the ninth edition of Babington's 'Manual of British Botany', by Henry and James Groves, was brought out, in which another entirely new account of the genus was drawn up by Miss Rachel F. Thompson, under the direction of F. J. Hanbury, who had previously begun an illustrated monograph of the group that treated little more than the Section *Alpina*. The account in the Manual comprises ninety-seven species and many varieties, which are placed in Fries's generic sections without the elaborate subdivisions invented by Williams. The third book was 'An Account of the British Hieracia', published in 1905 by the Rev. W. R. Linton. The arrangement here is again mainly founded on Fries's work, though differing in detail from the classifications of Williams and Hanbury, and the number of species described becomes one hundred and twenty-four, exclusive of varieties. Linton's work has been generally accepted as the best account of the genus, as represented in Britain, but it can readily be seen on comparison to be very inferior to the Monograph of the British *Rubi* written by the Rev. W. Moyle Rogers in 1900.

In 1925 the eleventh edition of 'The London Catalogue of British Plants' was issued. Hanbury, the nominal editor, secured the help of C. E. Salmon for its production, and Salmon entrusted the revision of *Hieracium* to the Rev. John Roffey, who had been interested in the genus for several years but had never produced any original work. It happened that a complete Monograph of the whole genus, written by K. H. Zahn, had just been published (1921-23) as a part of Engler's *Pflanzenreich* (iv. 280-Compositae-Hieracium), and it occurred to Roffey that the most up-to-date list of the British species would be secured by abstracting from Zahn's work all the species, subspecies and varieties that were shown therein as British. A list on this basis was accordingly compiled, and the new catalogue was printed with two hundred and forty-eight species and seventy varieties, arranged in eleven sections ultimately based on the work of Fries. The species were generally equivalent to Zahn's subspecies, and in a large number of cases unfamiliar names, new to British botany, were introduced. Brief explanations of some of these novelties were furnished by Roffey in the 'Journal of Botany' later in the year. As was remarked by a reviewer

at the time, the introduction of the new list, with its many strange names, into a catalogue of British plants seemed out of place when no British Flora or Handbook existed in which such names were to be found, but, it was added, though it might tend at first to increase rather than reduce confusion, yet it would draw attention to the discrepancies between the views of our own botanists and those of the chief monographer of the genus, and should stimulate the production of a more adequate British work. A second edition of G. C. Druce's 'British Plant List' (1928) showed a *Hieracium* list somewhat similar to that compiled by Roffey. Since 1928 the co-existence of the three latest descriptive accounts of the British species, varying appreciably in their treatment, and the two recent catalogues, both differing widely from these accounts in arrangement, and with a much extended list of species with a host of strange specific names, has stifled interest in the group and brought all further work to a standstill. It is in the hope of reducing this confusion and establishing a new basis for further study of the genus in Britain that this Prodrömus has been prepared.

HISTORY.

Williams, in his 'Prodrömus' (iii. 84), states that the name *Hieracium* first occurs in the treatise 'De Medica Materia' of Dioscorides, where two species, *H. majus* and *H. minus*, are mentioned. The two plants, however, are not *Hieracia* in the modern sense, and have been identified with *Sonchus arvensis* and *Leontodon autumnalis*. The first true *Hieracium* to be distinguished seems to have been *H. Pilosella*, which was described by Brunfels (Herbarum Vivae Eicones, c. 192) in 1530 as *Pilosella* or *Auricula Muris*, 'with yellow flowers and hairy leaves, one side green, the other white, lying on the ground, and a little hairy stem'. Williams (l. c. 86) says that the red colour of the back of the ligules is noticed by Brunfels, but the only pertinent remark that I can find ('cum flore rubeo' in the edition of 1532 (c. 182)) is certainly not clear. The earliest unmistakable reference to this feature that has been observed is in Ray's 'Historia', i. 242 (1686), where he writes under *Pilosella repens* 'Flosculi pallide lutei, extimi . . . foris purpurascentes'. In the 'Historia Stirpium' of Leonhart Fuchs (1542) the two kinds of *Hieracium* known to Dioscorides are well figured (p. 319). An excellent plate of *Pilosella major* (*H. Pilosella* L.) is also given (p. 605), and a *P. minor* (*Antennaria dioica*) is added. The two kinds of *Hieracium* and the two *Pilosellas* are included in William Turner's 'Names of Herbes' (1548). The 'Stirpium Historia' of Mathias de L'Obel (1576) describes and figures *Pilosella major* (poor and not comparable with Fuchs's plate), and five species of *Hieracium*. These are:—*H. majus* (*Sonchus arvensis*), *H. minus* (*Leontodon autumnalis*), *H. longius radicata* (*Hypochaeris radicata*), *H. sabaudum* (*H. umbellatum* L.) 'marginibus nihil frequentius agri Antverpiani', and *H. narbonense falcata siliqua* (*Rhagadiolus stellatus*). A *Pulmonaria Gallorum flore Hieracii*, which is probably akin to *H. maculatum* Sm., is also included. Dodoens (Stirpium Historiae Pemptades (1583)) follows and takes his figures from Lobel, but alters the name *H. sabaudum* to *H. primum*. The Herball of John Gerard (1597) contains several species of *Hieracium* and four of *Pilosella*, but adds little to existing knowledge; *H. umbellatum* L. appears here as *H. intybaceum*. In 1601 the 'Rariorum Plantarum Historia' of Charles de l'Escluse (Clusius) was published, and in i, lib. 5, p. 140, a *Hieracium britannicum*, which he had seen during his visit to England in 1581, is described. This was identified by Ray with the plant now known as *Crepis paludosa*. Clusius also describes a *Hieracium alpinum hirsuto folio*, which he figures as *H. villosum*. The plate clearly depicts *H. villosum* L. The ponderous tome of Basil Besler, Hortus Eystettensis (1613), adds two important plants, *H. latifolium peregrinum phlomoides* (*H. aurantiacum* L.), which may be the *Hieracium* ix of Clusius's Historia, and *H. frutescens latifolium polyanthos* (*H. boreale* auct.), which is carefully distinguished from the *H. sabaudum* of Lobel (*H. umbellatum* L.). A further distinct Hawkweed was described and figured

in 1616 in Fabio Colonna's 'Stirpium Ecphrasis', ii. p. 29, t. 30, f. 2, as *H. alpinum alterum minimum lanuginosum*. This is probably *H. alpinum* L. or one of its allies. These and the other hawkweeds distinguished up to this time are brought together in the Pinax of Caspar Bauhin (1623), where the aphyllopodous species are designated *Hieracia fruticosa*.

From this date onwards various species of *Hieracium* were recorded as natives of Britain. In the second edition of Gerard's Herball (1633) Thomas Johnson gives *Pulmonaria gallica sive aurea latifolia* (*H. exotericum* Jord.) as a Surrey plant, and *P. gallica sive aurea angustifolia* (*H. maculatum* Sm. ?) as growing in Berkshire. A little later, in John Parkinson's Theatrum (1640) *H. fruticosum latifolium hirsutum* (*H. boreale* auct.) and *H. fruticosum angustifolium majus* (*H. umbellatum* L.) are cited from Hampstead. John Ray, in his 'Historia Plantarum' v. 1, cap. vii (1686), adds *H. fruticosum latifolium glabrum* (*H. latobrigorum* Zahn) from the English Lakes district, and a species with spotted foliage from Sussex.

The year 1690 is notable for the publication of Ray's 'Synopsis methodica Stirpium Britannicarum', which may be regarded as the earliest British Flora. The distribution of our plants was then but very partially known, and as the only mountains that had been botanically explored were those of North Wales (largely by Edward Lloyd), a special interest attaches to the Welsh *Hieracia* enumerated. The list of *Hieracia* (pp. 44 sq.) is as follows :—(1) *H. fruticosum latifolium hirsutum* C.B. (*H. boreale* auct.), very common in woods; (2) *H. fruticosum latifolium glabrum* Park. (*H. latobrigorum* Zahn), Ullswater; (3) *H. fruticosum angustifolium majus* C.B. (*H. umbellatum* L.), sandy and stony places; (4) *H. murorum folio pilosissimo* C.B. (*H. exotericum* Jord.), woods, old walls, etc.; (5) *H. Pulmonaria dictum angustifolium* (*H. maculatum* Sm. ?), Newbury, Berks.; (6) *H. Pannonicum latifolium primum* Clus. I. (*Hypochaeris maculata* L.)—removed from *Hieracium* by Ray in ed. 2; (7) *H. villosum alpinum latifolium magno flore* Park. C.B. (*H. villosum* L. ?), occasionally on higher rocks of North Wales; (8) *H. montanum angustifolium nonnihil incanum* C.B. (*H. argenteum* Fr.), summit of Glydyr, near Llanberis; (9) *H. murorum laciniatum minus pilosum* C.B. (*H. Leyi* Hanb. ?), greater rocks and rocky slopes of the valley of Llanberis; (10) *H. fruticosum alpinum latifolium minus uno vel altero flore* (*H. orimeles* W. R. Lint.), higher rocks about Llanberis plentifully; (11) *Pilosella major repens hirsuta* C.B. (*H. Pilosella* L.), everywhere in dry pastures.

A second edition of the Synopsis was issued in 1696, in which no. 8 above is omitted and three new species are added. The novelties are :—(1) *H. macrocaulon hirsutum folio rotundiore* (an *H. fruticosum folio subrotundo* C.B. ?), Edinburgh Park and Long Sledale, Westmorland; the identity of this plant is doubtful; it is possibly *H. subcrocatum* (Lint.); (2) *H. leptocaulon hirsutum folio longiore* (*H. anglicum* Fr. ?), Anna Well, Westmorland; and (3) *H. seu Pilosella majoris species humilis, foliis longioribus rarius dentatis plurimus simul, flore singulari nostras* (?), Rickmansworth.

In 1713 James Petiver's 'Catalogue of Mr. Ray's English Herball' appeared, with woodcuts, not always original, of the species enumerated. Plate xiii of this work shows eleven hawkweeds, representing the first eight species of the second edition of the Synopsis. Petiver seems to have known well the hawkweeds growing round London, but not those further afield. He figures one only from Wales (no. 7), adopting Clusius's plate of *H. villosum* and stating simply that it grows on rocks in North Wales. Four of his figures depict narrow-leaved forms from Hampstead woods, and of these two belong to *H. umbellatum* and two to *H. tridentatum* Fr. His *H. murorum folio pilosissimo*, said to grow on old walls and in woods about London, recalls *H. Lachenalii* Gmel. rather than *H. exotericum*.

A third edition of the Synopsis was brought out eleven years later by Johann Jacob Dillenius, which remained the standard text-book of British botany till the advent of Hudson's 'Flora Anglica' in 1762. Dillenius combined two of Petiver's narrow-leaved plants from Hampstead (f. 8 & 10) to form a new species *Pulmonaria fruticosa longifolia* (and *angustifolia*) *hirsuta* (*H. tridentatum*), and distinguished also

his *Pulmonaria graminea* (*H. umbellatum* var. *linariifolium* Wallr.). *H. villosum alpinum latifolium magno flore* of the former editions, which Petiver had figured, is cancelled, and a new species substituted, *H. villosum alpinum flore magno singulari caule nudo*, which is described and figured (tab. vi, f. 2). This is *H. holosericeum* Backh. A remark is inserted that Vaillant believed the plants from Edinburgh Park and Anna Well to be varieties of *H. murorum folio pilosissimo* C.B. We now come to the works of Carl Linnaeus.

In the first edition of 'Species Plantarum' (1753) Linnaeus described twenty-six species of *Hieracium*, of which several have been subsequently removed to *Crepis* and other genera. Of the remainder seven are represented in Britain, either as native or naturalized plants. These are *H. alpinum*, *H. Pilosella*, *H. aurantiacum*, *H. murorum*, *H. amplexicaule*, *H. sabaudum* and *H. umbellatum*. The Linnaean Herbarium contains contemporary specimens of *H. alpinum*, *H. Pilosella*, *H. aurantiacum*, and *H. murorum*, which are available for typifying the species. *H. alpinum*, like *H. amplexicaule*, is a fairly marked plant that has given rise to little ambiguity. *H. Pilosella* is founded on the diagnosis of the Hortus Cliffortianus, from which the specimen is now missing. The example in the Linnaean Herbarium is in poor condition, but is sufficient to show the salient features of the species and may therefore be taken to represent the typical plant. The typification of *H. aurantiacum* was dealt with at length in my paper in Journ. Bot. lix, 60 sq. (1921), and the name shown to belong to the plant represented both in the Linnaean Herbarium and the Hortus Cliffortianus.

The name *H. murorum* L. has been generally abandoned in recent works as not referable to any definite species as now understood. In 'Species Plantarum', p. 802, it appears thus :—

15. *H. caule ramoso, foliis radicalibus ovatis dentatis ; caulino minore.* Hort. Cliff. 388. Fl. Suec. 637. Roy. Lugdb. 123. Dalib. Paris. 237. Gmel. Sibir. 2, p. 25.
H. caule ramoso, foliis ovatis dentatis. Fl. lapp. 284.
H. murorum folio pilosissimo. Bauh. Pin. 129. Corchorus. Dalech. Hist. 565..... *pilosissimum*.
β. *H. murorum laciniatum, minus pilosum.* Bauh. Pin. 129. It. wgoth, 257.. *silvaticum*.
Pulmonaria gallica femina. Tabern. Hist. 504.
γ. *H. macrocaulon hirsutum, folio longiore.* Raj. angl. 3, p. 169.
Hab. in Europae apricis duris.

It will be seen that Linnaeus furnishes neither diagnosis nor description, and that the species is primarily based on the Hortus Cliffortianus. There are two sheets of *H. murorum* in the Linnaean Herbarium which, according to Jackson, were there in 1753 ; there are also two sheets in Hort. Cliff. The first sheet in the Herbarium shows a plant with a good radical rosette of broadly oval, more or less pilose leaves, truncate-based and sharply serrate with reversed basal teeth ; one linear, toothed, stem-leaf ; and a four-headed panicle of broad-based heads, which are pilose and, like the peduncles, apparently eglandular. The second sheet has a slender plant with two oblong radical leaves, and one large, lanceolate stem-leaf ; its flower-heads have been destroyed. The first sheet of Hort. Cliff. has two detached radical leaves, which are broadly oval, subtruncate-based and little toothed, and two separate scapes, (1) with three rather large, stylose-flowered heads and a semi-amplexicaul stem-leaf, and (2) with many small, panicked heads, which, like the peduncles, are glandular and epilose. The second sheet shows a scape with several heads, and two stem-leaves, which are long-lanceolate and lacinate-toothed. Of these four exsiccatae that on the first sheet of the Herbarium is the most adequate. In its truncate-based leaves with reversed basal teeth, and its pilose, eglandular heads it recalls *H. bifidum* Kit. or *H. stenolepis* Lindbg., but its present condition precludes a positive determination. The second sheet is quite indeterminable, but has the aspect of an Oreadean species. The first sheet in Hort.

Cliff. has two different plants, the stylose-flowered scape uncertain, the other panicle of small, glandular heads evidently allied to *H. pellucidum* Laest. It is not clear to which scape the detached leaves belong. The plant of the second sheet, which recalls *H. vagans* Ley, is too fragmentary for determination. None of the four sheets indicates that one of Linnaeus's varieties is represented. They show at least four different plants, and the specimen on Herbarium sheet 1, which alone is complete enough to be adopted as a specific type, definitely disagrees with the only description (that taken from Hort. Cliff.) in that its radical leaves are truncate-based with reversed basal teeth instead of 'ovatis dentatis'. Linnaeus probably intended the specific epithet to cover any phyllopodous, scapiform hawkweed with a compound inflorescence, and there seems no option but to regard *H. murorum* L., in a segregate sense, as a *nomen confusum*. It will be noticed in the description above that var. *pilosissimum* is unlettered, that β is var. *silvaticum*, and that γ , which is probably *H. anglicum* Fr., has no varietal epithet. It is possible that the letters β and γ are misplaced, and that they should indicate the varieties *pilosissimum* and *silvaticum* respectively.

Fries subsequently (Symb. p. 112) showed *H. murorum* α , by which he presumably intended the typical Linnaean species, as a synonym of his *H. caesium*; and later (Epicr. p. 91) he introduced a *H. murorum* * *silvaticum* to represent the forms with glandular inflorescence such as *H. pellucidum*.

Linnaeus's specimens of *H. subaudum* and *H. umbellatum* appear to have been placed in his herbarium after the publication of 'Species Plantarum' and cannot therefore be treated as specific types. The example of the former is poor and not characteristic, but there is a good specimen in Hort. Cliff.; that of the latter has narrow, sparingly toothed foliage such as is commonly seen in this country.

From the time of Linnaeus to the present century the number of described species of *Hieracium* has grown with ever-increasing rapidity. Villars, Allioni, Hoppe and others made some notable additions to the Linnaean list; and the work of these earlier botanists was reflected in the account furnished by Froelich in De Candolle's Prodrômus, v. vii (1838), in which 188 species are recognized. In 1848 over forty new species were published in Elias Fries's 'Symbolae Historiae Hieraciorum', among which are some reputed to be British. A further number of French species were described by Alexis Jordan in his Dijon and Grenoble Catalogues (1848-49), and many others in the third edition of Boreau's 'Flore du Centre de la France' (1857). In his later work, 'Epicrisis Generis Hieraciorum' (1862), which is a concise monograph of the whole genus as then known, Fries admits 206 numbered species (excluding *Stenotheca*) with numerous subspecies and varieties. Jordan's species are almost entirely ignored by Fries, many others are reduced to synonymy, and of Backhouse's new British species, which had been published in 1856, only one, *H. lingulatum*, is accorded full specific rank. This last work of Fries is of special importance on account of its general classification of the genus, which has been largely followed. *Hieracium* is divided by Fries into three subgenera, *Pilosella*, *Archieracium*, and *Stenotheca*, the last now usually separated as a distinct genus. *Pilosella* is subdivided into four sections, *Pilosellina*, *Auriculina*, *Rosella* and *Cymella*; and *Archieracium* into three 'series' (1) *Aurella*, including *Alpina*, *Amplexicaulia* and *Cerinthoidea*; (2) *Pulmonarea*, including *Oreadea*, *Vulgata*, and *Alpestris*; and (3) *Accipitrina*, comprising *Tridentata*, *Prenanthoidea*, *Foliosa*, *Sabauda* and *Umbellata*. Fries appears to have been the first to send out sets of exsiccatae of the genus.

During the last quarter of the nineteenth century many more French species were described by C. Arvet-Touvet in 'Les Hieracium des Alpes Françaises' (1888) and elsewhere; and further novelties were introduced by K. H. Zahn in the third edition of Koch's 'Synopsis der Deutschen u. Schweizer Flora' (1901). A valuable contribution to the *Hieracium* literature of this period is Hugo Dahlstedt's 'Bidrag till Sydöstra Sveriges Hieracium-Flora' (1893-94), and the author is responsible for a large number of new species and subspecies. In the subgenus *Pilosella* a host

of new subspecies was created in Naegeli and Peter's 'Die Hieracien Mittel-Europas' (1885). Lindeberg, Peter, J. P. Norrlin, Arvet-Touvet, Dahlstedt, Zahn, and rather later, H. Sudre, did further valuable work in issuing sets of exsiccatae. The last-named also produced in 1902 an interesting work, 'Les Hieracium du centre de la France', in which most of the forms described are illustrated by small figures.

The result of this increasing interest in hawkweeds may be seen in the second edition of Schinz and Keller's 'Flora der Schweiz, ii. Teil; Kritische Flora' (1905), where about 780 subspecies are dealt with by Zahn. In Rouy's 'Flore de France', tome ix, published the same year, *Hieracium* occupies 223 pages, and 277 species, subspecies, and the more or less equivalent 'formes', with 587 additional varieties, are described. The monumental Monograph of Zahn, 'Pflanzenreich, iv. 280, Compositae-Hieracium', was printed in 1921-23, and is evidently the result of a life-long study of the genus and its literature. It aims at treating the whole genus uniformly and completely, and describes 756 species, distributed in four subgenera, *Eu-Hieracium*, *Stenotheca*, *Mandonia* and *Pilosella*. Most of these species have many subspecies, e.g., *H. Pilosella* L. has 624, and *H. murorum* L. 345. The index of species, subspecies and varieties occupies 120 pages and includes approximately 18,000 names. This compares with 10,015 species shown in the 'Index Kewensis' and its eight supplements. Excepting the few forms of *Stenotheca*, all of the European species belong to the subgenera *Eu-Hieracium* and *Pilosella*. The former of these is divided by Zahn into twenty-five sections, somewhat differing from those established by Fries. They are :—

A. Phyllopoda.

I. Trichophylla.

a. Aurella.

Sect. I. Glauca. Sect. II. Villosa. Sect. III. Barbata.

b. Cerinthoidea.

Sect. IV. Cerinthoidea.

c. Pulmonarea.

Sect. V. Oreadea. Sect. VI. Stelligera. Sect. VII. Vulgata.

II. Plumosa.

Sect. VIII. Lanatella. Sect. IX. Lanata. Sect. X. Pannosa.

III. Glandulosa.

Sect. XI. Heterodonta. Sect. XII. Alpina. Sect. XIII. Amplexicaulia.

B. Aphylopoda.

I. Viscosa.

Sect. XIV. Intybacea.

II. Prenanthoidea.

Sect. XV. Prenanthoidea.

III. Accipitrina.

Sect. XVI. Tridentata. Sect. XVII. Umbellata. Sect. XVIII. Foliosa. Sect. XIX. Eriophora. Sect. XX. Sabauda. Sect. XXI. Glauciformia. Sect. XXII. Italica. Sect. XXIII. Bracteolata.

C. Hololeion.

Sect. XXIV. Hololeia. Sect. XXV. Schmalhausenia.

The subgenus *Pilosella* is divided thus :—

Acaulia.

Sect. XL. *Pilosellina*. Sect. XLI. *Castellanina*.

Cauligera.

Cauligera humilia.

Sect. XLII. *Auriculina*. Sect. XLIII. *Alpicolina*.

Cauligera elata.

Chlorophylla.

Sect. XLIV. *Pratensina*. Sect. XLV. *Cymosina*.

Poliophylla.

Sect. XLVI. *Echinina*.

Glaucophylla.

Sect. XLVII. *Praealtina*.

Of the 756 species described only a relatively small proportion falls directly within the above-named Sections, the majority being regarded as *species intermediae* or *zwischenarten*, or hybrid species, which are described between the sections with which they are connected. The species referred to the Sections are classified in brief keys under the Sections, but similar keys are not furnished for the more numerous *species intermediae*. The subspecies are well arranged in what purports to be a natural order under the collective species. For purposes of identification it is more or less practicable to name a subspecies placed under one of the Sections, but definitely less so if the subspecies forms part of a *species intermedia*, which itself may not be readily recognized. The only Sections with which British plants are connected are, among the *Eu-Hieracia*, *Cerinthoidea*, *Oreadea*, *Vulgata*, *Alpina*, *Amplexicaulia*, *Prenanthoidea*, *Tridentata*, *Umbellata* and *Sabauda*, and under *Pilosella*, *Pilosellina*, *Auriculina*, *Pratensina* and *Praealtina*. It is impossible not to admire this work of Zahn's, which is a monument of critical research, patient investigation and infinite labour; and when, in classifying the British forms, which form but a small fraction of the whole, one is unable sometimes to agree with his conclusions, it may well be wondered that such differences of opinion are not more frequent, when the complexity of the genus is remembered, and the difficulty or impossibility of a monographer obtaining adequate material for examination of the almost innumerable forms involved.

BRITISH WORK SINCE THE TIME OF LINNAEUS.

In British botany the publication of Linnaeus's 'Species Plantarum' was followed in 1762 by William Hudson's 'Flora Anglica', in which the new binomial system is adopted. Hudson's species of *Hieracium* are (p. 298):—*H. alpinum* L., *H. Pilosella* L., *H. dubium* L., *H. Auricula* L., *H. murorum* L., with vars. β , γ , δ and ϵ , *H. paludosum* L., *H. sabaudum* L., with vars. β and γ , and *H. umbellatum* L., with vars. β and γ . Two of these plants, *H. dubium* and *H. Auricula*, were introduced by Hudson as additions to the British flora and have given rise to much controversy. A similar list appears in William Withering's 'Botanical Arrangement of British Plants', ed. 1 (1776), with *H. murorum* divided into *a pilosissimum* and *β sylvaticum*. In 1790 'English Botany' was begun by Sir James Edward Smith and James Sowerby, and was continued until 1814. The first *Hieracium* to be included was *H. sabaudum*, which was described and figured (E.B. 349) in 1796, and seventeen

others were subsequently dealt with. Smith's 'Flora Britannica' was published in 1800, and here (v. ii. pp. 827-830) twelve species appear, viz. :—*H. alpinum* L. (Llanberis and Highlands), *H. Pilosella* L., *H. dubium* L. (N. England), *H. Auricula* L. (N. England), *H. murorum* L., with β and γ , *H. sylvaticum* Gouan (*H. murorum* var. *sylvaticum* With.), *H. paludosum* L., *H. molle* Jacq., *H. villosum* L. (Ben Nevis and Ingleboro'), *H. sabaudum* L., with β and γ , *H. prenanthoides* Vill., and *H. umbellatum* L. The complete list of Smith's *Hieracia*, as printed in his 'English Flora', iii. pp. 354 sq. (1825), after the completion of 'English Botany', is :—*H. alpinum* L. (E.B. 1110), *H. Pilosella* L. (E.B. 1093), *H. dubium* L. (E.B. 2332), *H. Auricula* L. (E.B. 2368), *H. aurantiacum* L. (E.B. 1469), *H. murorum* L., with var. β (E.B. 2082), *H. maculatum* Sm. (E.B. 2121), *H. sylvaticum* Gouan (E.B. 2031), *H. pulmonarium* Sm. (E.B. 2307), *H. Lawsonii* Vill. (E.B. 2083), *H. paludosum* L. (E.B. 1094), *H. molle* Jacq. (E.B. 2210), *H. cerinthoides* L. (E.B. 2378), *H. villosum* L. (E.B. 2379), *H. sabaudum* L., with var. β (*H. fruticosum latifolium glabrum*—Ullswater) and var. γ (E.B. 349), *H. denticulatum* Sm. (E.B. 2122), *H. prenanthoides* Vill. (E.B. 2235), and *H. umbellatum* L., with vars. β and γ (*Pulmonaria angustifolia glabra* and *P. graminea*) (E.B. 1771). Two of these species, *H. paludosum* and *H. molle*, have since been transferred to *Crepis*. Smith's accounts of the *Hieracia* are of especial value through the excellence of the plates. It will be noticed that the Welsh Hawkweeds distinguished by Ray are omitted both by Hudson and by Smith. After the 'Supplement' to 'English Botany' was begun by W. J. Hooker in 1829 two further *Hieracia* were published in the same form, *H. amplexicaule* L. (E.B.S. 2690), and *H. Lapeyrousii* Froel. (E.B.S. 2915). The first edition of C. C. Babington's 'Manual of British Botany' (1843) gives (pp. 181-186) *H. Pilosella* L., [*H. dubium* L.], [*H. Auricula* L.], *H. aurantiacum* L., *H. alpinum* L., *H. villosum* L., *H. murorum* L., *H. diaphanum* Fr. (*H. Lawsonii* Sm.), *H. sylvaticum* Sm., *H. Lapeyrousii* Froel. ?, *H. cerinthoides* L., *H. amplexicaule* L., *H. denticulatum* Sm., *H. prenanthoides* Vill., *H. inuloides* Tausch !, *H. sabaudum* L., *H. boreale* Fr., *H. rigidum* 'Hartm.' Fr., and *H. umbellatum* L. with var. *Taylorii*.

The first British volume devoted to the genus is the 'Monograph of the British *Hieracia*' by James Backhouse Junr., which was published in 1856, when the author was only thirty-one years old. Backhouse had been in the habit of spending holidays with his father in the mountainous parts of Great Britain, and was evidently attracted by the alpine hawkweeds. His Monograph is based on the system of Fries, with three subgenera, *Piloselloidea*, *Pulmonarea*, and *Accipitrina*, divided into eight sections and thirty-three species. Eleven of the species were new, and all of them have been subsequently maintained by the majority of authors. Eight belong to the *Alpina* or *Nigrescentia*, and the remaining three, falling under his *Pallida*, are likewise Scottish mountain plants. The Monograph is essentially an account of the *Hieracia* of Upper Teesdale, and the Clova and Braemar districts in Scotland; and only well-known species inhabiting other parts of these islands are dealt with. The specific descriptions are good and uniform throughout. Unfortunately, after writing the Monograph, Backhouse appears to have taken no further interest in hawkweeds, and although treated as the British authority on the group until his death in 1890, he became less and less able to criticise usefully the specimens, often from fresh localities, that were referred for his opinion.

A revised account of the genus, founded on Backhouse's work, appeared ten years later in the third edition of 'English Botany', vol. v. (1866), written by J. T. Syme (later Boswell-Syme and Boswell). This is the most comprehensive work on the group, as found in Britain, that had yet been produced, and its classification is as follows :—

Sect. I. *Piloselloidea*.

H. Pilosella L., α *genuinum*, β *pilosissimum* Fr. *H. aurantiacum* L.

Sect. II. *Pulmonarea* (including *Aurella* Fr.).

Group A. Alpina.

H. calenduliflorum Backh. *H. eximium* Backh., β *tenellum* Backh. *H. holosericeum* Backh. *H. melanocephalum* Tausch., α *genuinum*, β *insigne* Bab. *H. gracilentum* Backh. *H. globosum* Backh. *H. chrysanthum* Backh., α *genuinum*, β *microcephalum* Backh. *H. nigrescens* Willd. *H. senescens* Backh. *H. lingulatum* Backh.

Group B. Amplexicaulia.

H. amplexicaule L.

Group C. Cerinthoidea.

H. anglicum Fr., α *genuinum*, β *decipiens*, γ *acutifolium* Backh. *H. iricum* Fr.

Group D. Villosa.

H. villosum L.

Group E. Vulgata (including Oreadea Fr.).

H. pallidum Fr. *H. cinerascens* Jord. (*H. lasiophyllum* Backh.). *H. Gibsonii* Backh. *H. argenteum* Fr. *H. nitidum* Backh. *H. aggregatum* Backh. *H. murorum* Fr. [sic], α *genuinum*, β *canescens*, γ *subcaesium* Fr. ? *H. caesium* Fr. ? α *genuinum*, β *obtusifolium* (Backh.). *H. flocculosum* Backh. *H. maculatum* Sm. *H. vulgatum* Fr. α *genuinum*, β *rosulatum*, γ *cinereum* Backh., δ *rubescens* Backh., ϵ *subnigrescens*.

Group F. Pseudo-Accipitrina (Pseudo-Pulmonarea Fr.).

H. gothicum Fr., α *genuinum*, β *latifolium* Backh. *H. tridentatum* Fr.

Sect. III. Accipitrina.

Group A. Umbellata.

H. umbellatum L.

Group B. Sabauda.

H. boreale Fr.

Group C. Foliosa.

H. corymbosum Fr. *H. crocatum* Fr. *H. strictum* Fr.

Group D. Prenanthoidea.

H. prenanthoides Vill. *H. Borreri*.

Syme creates one new species and four new varieties. It is to be regretted that his plates are very inferior to those of the original 'English Botany'.

From 1866 onwards to the end of the century no further elaboration of the genus is shown in any British Flora or handbook, and indeed, in Sir Joseph Hooker's 'The Student's Flora of the British Islands', ed. 3 (1884), the number of species is reduced to eleven, with seven subspecies, Backhouse's species, and a few other well-known forms being relegated to the rank of varieties.

About this period, however, interest in the genus was being resuscitated, largely by the explorations of Frederick Janson Hanbury. Like Backhouse, he was attracted as a young man by the alpine species, and made several expeditions to the Scottish Highlands in 1885 and subsequent years. He did not confine his attention to the *Alpina*, and soon began to refer his gatherings to the Swedish botanist, C. J. Lindeberg, by whom he was greatly influenced. At a later date he also consulted another Scandinavian, M. Elfstrand, of Uppsala, who eventually went through and revised the naming of his whole collection of the genus. Hanbury's first publication was a paper in the 'Journal of Botany' in 1888, in which several continental species, hitherto unknown here, were reported as British. These were named by Lindeberg.

In addition, three new species were published, *H. langwellense*, *H. pollinarium* and *H. scoticum*, but without any real descriptions. This paper was followed in 1889 by another in the same Journal, which included four further new species, *H. Backhousei*, *H. caledonicum*, *H. farrense* and *H. proximum*, and two new varieties. Here again the descriptions are very inadequate. In the same year the first part was published of Hanbury's 'Illustrated Monograph of British Hieracia'. This was planned as a sumptuous work, with every species and the leading varieties figured in full-sized plates in colour reproduced from water-colour drawings mostly by Miss Gulielma Lister. These drawings, now the property of the Natural History Museum at South Kensington, are generally extremely fine. The plates themselves are excellent in most respects, but not always calculated to show well the plants' essential features, and after a few parts of the Monograph had been issued their production was interrupted, and the work came to a close in 1898. The plants dealt with in all were *H. Pilosella*, *H. aurantiacum*, and *H. pratense*, the *Alpina* group (including *Nigrescentia*) and *H. anglicum*. Drawings and, in some cases, plates of further species, mainly Oreadean, were prepared but never published. The untimely end of this enterprise was much regretted by contemporary British botanists, but as the parts were being issued, necessarily at rather long intervals, so many new species were brought to light that Hanbury no doubt came to realize the impracticability of describing and depicting in coloured plates on the original scale such a large number of critical and often closely related forms. Besides this fragmentary Monograph Hanbury's most important paper on *Hieracium* was published in the 'Journal of Botany' in 1892, and completed in 1893. It contains ten new species, the descriptions of which are more adequate than those of his earlier papers, and in addition there is a large number of new varieties. Furthermore, a number of foreign species, lately identified as British, are included. Hanbury's last paper on the genus appeared in the same Journal in 1894. In this seven more new species were established, together with many new varieties, and other plants identified with Scandinavian forms are added. Very few of the novelties are described. The most important feature of this paper was a tentative list of the whole genus (British) as known to Hanbury, classified as it was intended to be produced in his monograph. It enumerates one hundred and four species and one hundred and fourteen varieties. Hanbury himself distinguished altogether twenty-four new species of *Hieracium*, all but one (*H. cantianum*) belonging to the phyllopodous groups of the subgenus *Eu-Hieracium*; he is also responsible for over thirty new varieties. The majority of the new species belong to the Sections *Oreadea* and *Cerinthoidea*, and are just as distinct as Backhouse's species of the *Alpina*. British botany owes Hanbury much for this work, which was carried out in the face of considerable discouragement from high quarters. The least satisfactory work on *Hieracium* with which Hanbury was connected is the account in the ninth edition of Babington's Manual (1904). The composition of a concise synopsis of ninety-seven species of a complex genus that would enable or materially assist students to identify specimens of the plants concerned involves a thorough knowledge of all the species and their salient characters, and the possession of critical acumen in a high degree. A successful example of this kind of work may be seen in the *Hieracia* of Gremlé's Swiss Flora, to which unfortunately the account in the Manual offers a woeful contrast. The details of the descriptions in the Manual are perfectly true as facts, but utterly useless, as written, for the purpose of aiding identification or classification, and the writer has sad memories of many long hours wasted thirty or more years ago in fruitless attempts at disentangling their exasperating vagaries. Hanbury was a good collector in the field, possibly rather too prodigal at times, and his herbarium of *Hieracia*, now in the Natural History Museum, is the finest British collection in existence of any individual botanist. It is remarkable for the number of extremely fine and luxuriant specimens, especially of mountain forms, that it contains, for Hanbury seems to have found better examples of many species than ever gladdened the eyes of his forbears or successors.

Simultaneously with the progress of Hanbury's work our Hawkweeds were being studied independently by two brothers, the Revs. Edward Francis and William Richardson Linton, who were already recognized as efficient British field botanists and experts in critical genera. Their first paper was an account by W. R. Linton of a new Derbyshire species, *H. holophyllum*, in the 'Journal of Botany' in 1890. This was followed in the succeeding year by another paper in the same Journal by E. F. Linton, describing two new Scottish species, *H. Marshallii* and *H. pictorum*, and adding notes on the occurrence in Britain of four other species. The descriptions of the new plants are fuller than those of Hanbury. In 1893 a more important paper appeared, again in the 'Journal of Botany', written by the brothers jointly. This embodies good descriptions of six new Scottish species (*H. graniticolum*, *H. clovense*, *H. Boswellii*, *H. stenophyes*, *H. eustales* and *H. orcadense*) and eight new varieties, as well as valuable notes on many other forms. In 1896 the brothers began the issue of a set of British *Hieracia Exsiccata*, which extended to 160 numbers by 1901. An additional fascicle of twenty-five numbers was sent out in 1906. The sets were filled partly by wild specimens, supplied sometimes by the brothers themselves, sometimes by the Revs. E. S. Marshall or Augustin Ley, and partly from plants grown in the gardens of the authors at Bournemouth or at Shirley, in Derbyshire. It is of the first importance in any set of exsiccatae that the specimens under each number should be homogeneous, and to this end, every specimen of a number should be taken, if possible, from a single locality. Unfortunately, the Lintons were sometimes unable to complete numbers from a single gathering, and used specimens from different stations which were not always identical. Instances of such mixtures were detected by Zahn, and further ones by the writer. Notwithstanding this defect, the Lintons' set—the only British one existing—is of great value, but the numbers must be cited with caution. A further new species from North Wales, *H. ogweni*, was published by E. F. Linton in the 'Journal of Botany' in 1897, and in 1905 W. R. Linton brought out his 'Account of the British *Hieracia*', which was intended as a substitute for the two recent accounts by Williams and Hanbury. It contains one hundred and twenty-four species, one subspecies, and one hundred and thirty-five varieties and forms. The classification is based on that of Fries but distinguishes the phyllopodous and aphylllopodous divisions of *Archieracium*, and the Section *Vulgata*, which includes fifty-three species, is subdivided afresh into *Silvatica*, *Subvulgata*, *Caesia* and *Eu-Vulgata*. The specific descriptions, although condensed as for a handbook, are generally satisfactory, but no keys, even to the larger groups, are attempted. Two new species, *H. candelabrae* and *H. Scullyi*, and twenty-five new varieties are described, some of the latter being attributed to Augustin Ley. Remarks of H. Dahlstedt and, more rarely, of M. Elfstrand are quoted under many of the descriptions. The distribution of the less common forms is usually given in detail, of the others only in general terms. The book gives the impression of somewhat hasty compilation, perhaps due to the author's failing health, for he died three years later at the early age of fifty-eight. None the less it has been found the most generally useful work by subsequent students of the genus. In 1911 E. F. Linton wrote his last paper on the group in the 'Journal of Botany', compiled largely from this brother's notes and describing three new species (*H. sordidum*, *H. dentifex* and *H. orithales*) and four new varieties.

Meanwhile another account of *Hieracium* already alluded to, written from a widely different standpoint, had been published by Frederic N. Williams in his 'Prodromus Florae Britannicae', parts iii. and iv. (1902 and 1903). This was compiled from the works of previous authors, largely continental, collated with the relatively meagre and fragmentary collections then to be found in the British herbaria at the Natural History Museum and at Kew. Unlike Hanbury and the Lintons, who knew the hawkweeds well in their wild habitats and in the garden, Williams probably scarcely ever examined a living *Hieracium*. Hence some of his remarkable statements, such as his description of the inflorescence 'determinate or

indeterminate ; evolving upwards or downwards ' (Journ. Bot. xl. p. 259). In the Prodrumus he adopts in general the classification of Fries, with the interpolation of the series *Phyllopoda* and *Aphylopoda* under the Subgenus *Archieracium*. Seventy-five species, with many varieties, are described. The Section *Vulgata* is sub-divided into eleven original Subsections, under which thirty-six species are somewhat grotesquely assorted. The *Foliosa* are merged with the *Sabauda*. The descriptions of the species and varieties (all in Latin) are of considerable length but no salient or contrasting characters are shown, nor are any keys of the species furnished. As a handbook aiding students to know their plants, or as a botanical account of the genus, the book is of little value, but it has its indirect uses. It draws attention to the work of Central European botanists, which had hitherto been almost overlooked here. Its opening chapter on the earliest references to British Hawkweeds is interesting though fragmentary ; and it usually gives full citations, and quotes synonyms, icones and exsiccatae. The presence of foliar glands in species of the *Alpina* section, hitherto unnoticed in British botany, is mentioned in the descriptions, and the character of the receptacular alveoles, to which Williams was the first in Britain to direct attention, is occasionally but by no means uniformly stated. Apart from this account in his Prodrumus, the only papers on the genus by Williams are five in the 'Journal of Botany' (1902), written while preparing that work, on the forms of *H. anglicum*, the interpretation of *H. murorum* L., and salient characters and hybridity in *Hieracium*.

Another assiduous worker on the Hawkweeds was the Rev. Augustin Ley, who concentrated chiefly on Welsh plants of the Section *Vulgata*. His earliest paper appeared in the 'Journal of Botany' in 1895 and described a new variety *cacuminum* of *H. diaphanum* from the Brecon Beacons. Three years later, in a second paper in the same Journal, he described two further varieties from South Wales, subsequently raised to specific rank as *H. cyathis* and *H. platyphyllum*. Two more Welsh varieties followed in 1899, likewise in the 'Journal of Botany', *H. caesium* var. *coracinum* and *H. sciaphilum* var. *pulchrius* ; and yet four more, with a new species *H. vagense*, in 1900. Ley amended his opinion of his varieties *cacuminum* and *platyphyllum* in another paper in the 'Journal of Botany' in 1901, where one more Welsh variety, *H. rigidum* var. *strigosum*, was described. His next paper, in the same Journal, appeared in 1907 and described three more (mainly Welsh) varieties and introduced to the British list five Scandinavian species or subspecies of Dahlstedt. One of the varieties, *H. britannicum* var. *ovale*, belongs to the Section *Oreadea*. The most important paper written by Ley is on "Brecon and West Yorkshire Hawkweeds", published in the 'Journal of Botany' in 1909. This deals with the distribution of the whole genus in the two counties, and offers criticisms on various groups, often due to the comments of Dahlstedt. An attempt is made to unravel the confusion then prevalent in British botany between *H. serratifrons* Almq. and *H. pellucidum* Laest. ; eight plants, previously described as varieties, either by himself or the Lintons, are raised to specific rank, and four more new varieties are established. Ley's final paper, in the usual Journal, was printed in 1910, the year before his death, and contains descriptions of a new species, *H. rectulum*, and two more Welsh varieties. Ley appears to have been a zealous and careful worker, who knew Wales extremely well, but whose outlook and botanical experience were narrower than those of Hanbury or the Lintons. He was evidently much influenced by Dahlstedt. But it must be remembered that the section which chiefly occupied his attention was the most difficult one in *Eu-Hieracium*.

Among other botanists interested in *Hieracia* William Hadden Beeby, who did so much work in Shetland, is worthy of mention. In 1891 he described in the 'Journal of Botany' a new species, *H. zelandicum*, belonging to the Section *Alpestris*, which has its British headquarters in this island group. Later, in 1908, he wrote an important paper in the 'Annals of Scottish Natural History' entitled "On the Flora of Shetland", in which he described two further new species of the same Section,

H. subtruncatum and an anomalous plant, *H. breve*. Four new varieties are also described in this paper. The Rev. Edward Shearburn Marshall, one of the best British collectors, described a new Scottish species, *H. anfractiforme*, in the 'Journal of Botany' in 1891, and twenty-two years later, two additional new species, also from the Highlands, *H. Isabellae* and *H. Shoolbredii*. Another clerical botanist, the Rev. W. H. Purchas, described a new species, *H. cymbifolium*, from Derbyshire in the 'Journal of Botany' for 1899.

After the beginning of the Great War in 1914 the study of *Hieracia* definitely waned in this country, and very few further papers can be traced in the 'Journal of Botany'. My own "Notes on British Hawkweeds" was printed in 1920, and adds *H. pulmonarioides* to the British list, as well as a new variety *angustisquamum* of *H. holophyllum*. A year later I wrote 'On *H. aurantiacum* L.', defining the specific type, and describing a new allied species *H. brunneococcum*. The volume for 1925 contains a review of the list in the new London Catalogue, and the compiler's explanation of some of the changes in nomenclature; and for the last eighteen years or more the name *Hieracium* has practically disappeared from the annual indexes. During 1928 and the succeeding years the late Col. H. H. Johnston, working at the flora of Orkney, sent *Hieracia* to Dahlstedt for determination, but generally with unsatisfactory results. Dahlstedt had deserted *Hieracium* for *Taraxacum*, and Johnston had reason to reflect that, if a reputation is not won till after it is deserved, yet it is certainly sometimes retained when deserved no longer. Three of Johnston's plants of this period, however, seem to be genuine additions to the British list. G. C. Druce, about the same period, sent plants for the Botanical Exchange Club (B.I.) to Zahn with little better results, showing how easily a great monographer, after the lapse of years, can be misled by inadequate specimens from a country with which he is not familiar.

MORPHOLOGY.

Eu-Hieracium.

The true hawkweeds are long-lived perennial herbs which produce annually from the rootstock deciduous shoots, varying from a radical rosette of leaves, that develops a leafless scape terminating in a single flower-head, to a leafy stem without a basal rosette bearing a compound cyme of heads. The forms producing radical rosettes have been termed phyllopodous, those with leafy stems without such rosettes aphylllopodous. These terms have sometimes been loosely and inaccurately applied. Zahn (l. c. p. 33) defines them thus:—'Innovatio per gemmas basales subterraneas, rosulas foliorum perhiementium denique cauligeras evolventes. Foliorum basaliu rosula tunc florendi tempore virens (nunquam emarcida)—Phyllopoda; vel sub—vel omnino emarcida—Hypophyllopoda; vel innovatio per gemmas perhiementes clausas anno proximo cauligeras, rosulam basalem haud evolventes—Aphylllopoda'. Rouy (Fl. France, ix. p. 235) cites a fuller definition of these terms taken from Sudre's 'Hieracium du Centre de la France', pp. 8, 9. It runs:—'Lorsque la plante se renouvelle par un bourgeon qui produit une rosette de feuilles à l'automne de la même année, et que cette rosette persiste jusqu'à l'anthèse à la base de la tige qui se développe l'année suivante, on dit qu'elle est *phyllopode*. Lorsque le bourgeon rosulifère ne développe complètement ses feuilles qu'avec la tige dans le courant de l'année suivante, la plante est *hypophyllopode*; si les feuilles radicales et celles du bas de la tige ne sont pas desséchées au moment de la floraison, la plante paraît phyllopode; si ces feuilles ne persistent pas, la plante paraît aphylllopode. Si le bourgeon ne se développe que l'année suivante, et ne produit pas de rosettes de feuilles radicales, le bas de la tige étant, dans ce cas, toujours nu au moment de la floraison, la plante est dite *aphyllopode*. Parfois, dans ce dernier cas, les feuilles de la partie inférieure de la tige sont beaucoup plus développées que les autres et rapprochées en fausse rosette; on dit alors que la plante est *pseudo-phyllopode*'.

Both these writers make sufficiently clear the aphyllopodous characters, and Sudre's conception of pseudo-phyllopody is equally unmistakable, but there is some confusion respecting phyllopody and hypophyllopody. In most, if not all of the so-called phyllopodous Sections of *Eu-Hieracium*, the rosettes produced one season generally lose their leaves during the succeeding winter, and in the following spring their growth is renewed, new leaves appearing and forming the rosettes afresh before the flowering scapes or stems finally arise. Thus the leaves of the rosettes seen at the flowering stage are of coeval growth with the flowers and not the product of the previous year when the rosette was first developed. This condition corresponds with the hypophyllodous rather than the phyllopodous definition of Sudre, and not strictly with either of the definitions of Zahn. It may be doubted whether all of the hawkweeds generally termed phyllopodous are not really hypophyllopodous as enunciated by Sudre; I do not know any species in which the radical rosettes, as seen in flowering specimens, are the product of the previous year. The term phyllopodous will therefore be retained for the state defined by Sudre as hypophyllopodous, and the latter term will be used in cases where the rosettes are of imperfect or anomalous growth, tending to approach the aphyllopodous condition, for in this, as in other features in *Hieracium*, there are intermediate stages. It sometimes happens, in unfavourable conditions, that rosettes continue their growth for two or more years without flowering, the leaves decaying each winter and a fresh crop appearing each spring.

In the extreme form of phyllopody the leaves form a close radical rosette and the inflorescence is a single-headed, leafless scape. This can be well seen in *H. alpinum* L. Other species, with a compound inflorescence, may have the same leafless scape, with the branches of the inflorescence subtended by small bracts or bracteoles, or they may produce a single well-developed leaf, often placed high on the stem, but below the branching. From this state the next transition is to a second, upper stem-leaf, always smaller and more rudimentary than the first, which may now be quite low on the stem; and thus the scapigerous may pass into a cauligerous plant with several stem-leaves, the lowest approximating in form to those of the radical rosette, and the others becoming smaller and less developed upwards until they are inseparable from the bracts supporting the branches of the inflorescence. From this phyllopodous, cauligerous condition there is a further stage towards aphyllopody, in which the bud producing the radical rosette elongates and develops at first scale-like leaves similar to those that clothe the base of the shoot in an aphyllopodous species. Such relatively lax buds usually produce imperfect rosettes consisting of but few leaves, and these leaves in some cases tend to be evanescent, withering before the time of flowering. This constitutes the hypophyllopodous stage. In aphyllopodous plants the buds are more truly subterranean, and the shoot immediately grows upwards, clad at first with scale-like leaves, which soon give place to foliaceous ones that from the beginning extend upwards along the stem. Occasionally, as in some forms allied to *H. gothicum* Fr., the leaves become crowded not far above the base of the stem, giving the plant a falsely phyllopodous (pseudo-phyllopodous) appearance. The aphyllopodous stems, whether flowering or not, invariably wither away during the winter.

The inflorescence of *Eu-Hieracium* is essentially determinate and cymose, evolving downwards. In its simplest form it is a one-headed scape, as in *H. alpinum* L. When 2-headed, the lateral branch or peduncle approximately equals in length the stalk of the flower-head terminating the main axis (accladium), and this terminal flower-head is always the first to open. This habit is often exemplified in *H. anglicum* Fr. With a more compound inflorescence, the flower-head of the accladium opens first, that of the highest lateral branch or peduncle next, and those of the lower branches later in succession downwards. If any of the branches have secondary branchlets, these flower similarly from the terminal head downwards. This order of flowering is believed to obtain throughout the genus. The form of the cyme varies considerably, though it always tends towards a corymbose outline. When

few-headed, as in the *Subalpina*, with only simple branches, some shorter than the acladium, it becomes racemose-corymbose. If, as usually with the *Oreadea*, the branches often equal or slightly overtop the acladium, and themselves produce single secondary branches reaching the level of the primary ones, the cyme assumes a furcate-corymbose aspect. With other species developing a more floriferous inflorescence, the branches may clearly exceed the acladium (which is sometimes quite short) and spread more or less horizontally, forming a false paniculate-corymb. This state is often seen among the *Vulgata*. In a few instances the internodes between the highest branches of the cyme are partially suppressed, giving rise to an aggregate or subumbellate inflorescence. Examples of this form are *H. aggregatum* Backl. and *H. umbellatum* L., among the aphyllopodous species and some of the *Tridentata* a very floriferous inflorescence is prevalent, with a terminal paniculate-corymb and lateral, compound branches springing from the axils of the leaves, occasionally nearly to the base of the stem. These lateral branches are sometimes nearly erect and impart to the plant a fastigiate aspect.

Hawkweeds show a great variety of foliage, the leaves being linear to nearly orbicular, entire to subpinnatifid, bright green to glaucous, spotted or unspotted. In the phyllopodous species the radical are generally petiolate, and the first few produced in spring from the rosette are more or less rudimentary and differ in form from those succeeding them. They are always much smaller and generally relatively broader and more obtuse; they commonly persist till the flowering time. These are termed 'primordial' in the descriptions of the species. The first leaves of the shoots of the aphyllopodous species are scale-like without laminæ, but they quickly give place to normal foliaceous leaves as the shoot rises from the ground and, as a rule, are evanescent and quite withered before the time of flowering. A gradation of leaf-form is commonly seen in the aphyllopodous plants from the base to the apex of the stem, the lowest leaves having the narrowest bases and so being more or less petiolate, while the uppermost are the most broadly based and tend to become amplexicaul.

The hair-clothing of the foliage, like that of the flower-heads, is threefold in character. Whitish simple hairs are to be found in most species on both sides of the leaves and especially on the petioles. These hairs may be soft and curled, as often seen in the *Vulgata*, or longer and denticulate, as in some of the *Cerinthoidea*. Or they may be stiff and more or less bristly, perhaps with a swollen or bulbous base, as with the *Oreadea*, in the species of which they are often conspicuous along the leaf-margins. This hair-clothing is termed 'setose' (seta, a bristle), and it should be noted that Backhouse, followed by Hanbury, incorrectly used this term to denote an indumentum of stalked glands. In addition to simple hairs the leaves of Hawkweeds are sometimes clothed with minute, white, stellate hairs (flocci). In a few British species these hairs are abundant on both leaf-surfaces, rendering them soft to the touch. More commonly, however, they are confined to the under surface and sometimes to the midribs of the uppermost stem-leaves. The third form of foliar hair-clothing is glandular. This is well marked in one section only of the British Hawkweeds, *Amplexicaulia*, where both sides of the leaves, as well as the stem, are thickly invested with yellowish or dark-coloured stalked glands, mixed or not with other simple hairs. A second British Section, *Alpina*, is also characterized by the presence of these foliar glands. Here, however, they are generally very sparingly produced, and in dried specimens are best seen along the margins of the inner rosette-leaves (or the stem-leaf, if present), where they occur as very fine yellowish, stalked glands at intervals between the very much larger simple hairs.

The uppermost part of the stem and the branches or peduncles of the inflorescence generally tend to produce a type of indumentum approaching that of the involucre of the flower-heads, and are almost invariably more or less floccose. The involucre are variable in shape, sometimes ovate or nearly globose, with a rounded to truncate

base, sometimes obconic and attenuate below ; this feature is best seen in the living plant. In fruit they commonly tend to broaden towards the base. In the following accounts of the species it has often been necessary to describe from dried material, but in a large number of cases fresh wild or cultivated specimens have been utilized. The notes of exclamation in the distribution lists indicate the species seen *in situ*, and, in these, living flower-heads have generally been available for description. The leaves of the involucre (phyllaries) in some species (particularly the *Oreadea*) are porrect in bud, i.e., they stand erect and overtop the young flower-buds ; in others they are incumbent or connivent, i.e., their tips bend inwards and meet together, so covering the flower-buds more or less closely. In two British species, *H. cyathis* Ley and *H. Sommerfeltii* Lindbg., they are porrect with the tips recurved outwards, offering the fanciful image of a cup or chalice. Incumbent phyllaries sometimes appear porrect in *exsiccatæ* through pressure in the process of drying. The imbrication of the phyllaries is stated by some authors to be regular in certain sections and irregular in others, but I cannot follow the alleged distinctions. In the British sections the imbrication seems always more or less irregular, with the outermost phyllaries distinctly shorter than the rest but not in a definite row ; in the phyllopodous sections the innermost are more or less finely pointed. The indumentum of the phyllaries furnishes important taxonomic characters, for the proportions of the different forms of hair-clothing are generally nearly constant in each species. Pilose hairs are found in varying quantity on the heads of most hawkweeds, and these are generally whitish with a thickened dark-coloured base ; more rarely they are dark in colour throughout. Their length is very variable. Glandular hairs (stalked glands) are also very prevalent. These are usually dark in colour, of variable length, sometimes nearly equal, sometimes conspicuously unequal. The glands themselves may be dark or yellowish, and sometimes very small in size. Minute yellowish, very shortly stalked glands, scarcely visible without a lens, are sometimes to be found, especially in species of the *Tridentata*, *Foliosa*, and *Sabauda*. These have been termed microglands. In addition, minute, white, stellate hairs are often present, and the phyllaries are then said to be floccose. This floccose hair is usually densest about the base of the involucre, but it may spread over the whole surface. It sometimes covers the margins of the phyllaries right up to their tips, where it may form a noticeable white tuft of hair. When this feature is well marked and the phyllaries are incumbent in bud, the whole bud appears to have a white, hirsute apex, and for this the term 'senescent', adopted from Backhouse, is here used. It should be remembered that in dried specimens the pilose and floccose hair of the involucre (and indeed of the foliage) invariably becomes brownish after the lapse of a few years, and materially changes the aspect of the flower-heads. This especially affects the silky heads of the *Alpina*.

There is a considerable variation in the size of the flower-heads (15–35 mm. or rarely 50 mm. in diameter when expanded), the length of the phyllaries ranging from (8)–10–15(–18) mm. The florets vary in number with the area of the involucrel receptacle. Heads with small receptacles and consequently few florets may, however, equal in breadth, when expanded in bloom, those in which the receptacles are larger and the florets more numerous, through an increased length of the outer florets. Such heads, which have been termed 'radiant', occur particularly in forms of the *Vulgata-Glandulosa*. The tube of the florets is normally hirsute, the pilosity commonly extending externally to the base of the ligule. The ligule itself is generally glabrous, but in some species, as in *H. alpinum*, the pilose hairs extend up its back to the apical teeth, while in others, notably in certain *Alpina* and *Cerinthoidea* among British plants, the back of the ligule above its base is glabrous, though pilose hairs are to be found about the apical teeth. Such ligules are commonly known as pilose-tipped or ciliate, and they afford a constant taxonomic character of some generic sections, while occurring only sporadically in others. In colour the ligules are concolorous, of varying shades of yellow, lightest in forms of *H. anglicum*

and of an orange tint in *H. fulvo-caesium*. A curious form of flower-head is sometimes produced, in which the ligules are undeveloped and all the florets remain tubular with exserted styles. These heads are known as 'stylose' and occur very generally in *H. Leyianum* (Zahn) and *H. cravoniense* (Hanb.). They are of the nature of aberrant mutations, and though derived from normal ligulate-flowered plants, are capable of reproducing themselves from seed. The colour of the styles has always been regarded by British botanists as a primary taxonomic feature, and Backhouse seems to have relied on it implicitly to distinguish his 'pallidum' from 'caesium'. It is certainly generally constant in most species, but its importance has been somewhat over-rated. Yellow styles are very variable in tint, sometimes of a pure chrome yellow, sometimes more orange, and then becoming brownish or fuscous; livid styles may be pale olive-green in colour, or dark and nearly black.

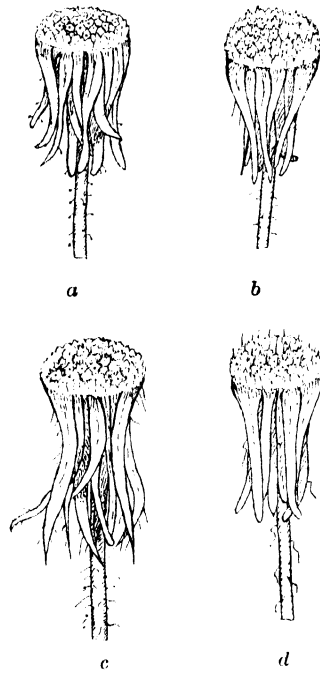


FIG. 1.—Receptacular alveoles after fall of Achenes. $\times 2$.

a. *H. Lachenalii*. b. *H. eustomon*. c. *H. anglicum*. d. *H. Bludonii*

An important feature that has received scant attention in this country is the structure of the involucreal receptacle, which does not always permit a ready examination in dried specimens. The florets are inserted in the receptacle in slight depressions or pits (alveoles), and it is these pits that furnish some definite characters, as in other genera of Compositae. The pits are surrounded by a more or less raised, scarious margin which is susceptible to considerable variation in development. In some species of the Section *Vulgata* the margins are obscure and irregularly crenate-dentate (fig. 1 a); in others they are more marked and irregularly dentate to subulate-dentate—a form that may be seen in many species of different sections (fig. 1 b). In the *Cerinthoidea*, *Umbellata* and a few isolated species of other groups they are irregularly toothed, and at the same time provided with fine, bristle-like hairs which render them ciliate or fimbriate (fig. 1 c). Again, chiefly in the *Sabauda*, they are irregularly

subulate-dentate with the teeth passing into unequal fibrillous setae or bristles that may be longer than the teeth themselves (fig. 1 *d*). These different modifications of the margins of the pits, which can hardly be due to vegetative influence or environment, are generally constant in the groups which they affect, and seem of some taxonomic importance. The fact that they sometimes appear outside their usual groups may in reality afford some clues to unsuspected relationships.

The fruits, termed 'achaeenia' by Zahn, range from 2.5 to 4.5 mm. (5 mm. in *H. macrocarpum*) in length, and are variously dark brown, blackish red or purplish black in colour, except in *H. prenanthoides* Vill. and *H. denticulatum* Sm., where they are pale fawn-coloured or fulvous. The pappus is generally pale tawny, but is whiter in *H. pellucidum* Laest. and a few other species, and tinted with red in some of the *Foliosa*. Williams counted the number of bristles in the pappus of many species, but came to no conclusions respecting the significance of their fluctuations.

Pilosella.

The general features of *Eu-Hieracium* are reproduced with some modifications in *Pilosella*. All of the species are phyllopodous, and many produce more or less elongate, prostrate, leafy stolons, which develop terminal rosettes that root and may persist through the winter. The leaves are always nearly entire, and without a distinct petiole. Their indumentum is variable as in *Eu-Hieracium*. The inflorescence is often scapiform and monocephalous, and when polycephalous, frequently compact and subumbellate, the flower-head of the acacladium always opening first. The heads are rarely large, and often much smaller than in the other subgenera (phyllaries (5)–7–10(–12) mm. long), with incumbent and frequently obtuse phyllaries variously clad. The ligules are glabrous-tipped and range in colour from light lemon-yellow to orange and deep red, in some species with yellow or orange flowers the outer ligules are externally striped or clouded with red. The colour of the styles is generally yellow, but livid in some, especially red-flowered species. The alveoles of the receptacle are surrounded by scarious margins that are sharply dentate in some forms and very obtusely so in others. The achenes are purplish black in the British species; their length is usually only 1.5–2 mm., but they sometimes attain 2.5 mm.

Cytology might be expected to throw some light on the taxonomic relationships in this protean genus, but according to the recently published Merton Catalogue but little work has yet been done on the group, and that mainly by Russian, Swedish and Japanese botanists. No British plants seem to have been examined, although results have been obtained in the case of several species reputedly British.

In Britain hawkweeds are subject to the attacks of two kinds of galls. One, in which the larva devours the contents of the flower-buds and causes a monstrous enlargement of the involucre, is common in some seasons, and may apparently affect any species. It has occasionally produced disastrous effects in my garden. The other, caused by a species of *Aylax*, produces a large swelling of the stem, often close to the inflorescence. I have usually seen this in wild plants of *H. umbellatum* and *H. tridentatum*.

CLASSIFICATION.

In the case of such a polymorphic group as *Hieracium*, consisting of a multitude of named forms with which no other genus of flowering plants can be compared, it is obvious that none but a botanist who has made a lifelong study of the whole group can hope to formulate independently any satisfactory general taxonomic classification; and hence it behoves workers dealing with some portion only of the genus to be generally guided by the work of Zahn, and to modify any part of it,

where it seems desirable to do so, in order to suit their own particular requirements. It is first necessary to grasp thoroughly the combinations of permanent characters of the recognized subgeneric groups and species ; and to this end, a good knowledge of the living plants, with their variations under different conditions of soil, light and shade, drought and excess of moisture, is essential. This can only be acquired by continuous observation in wild habitats and under cultivation. In *Eu-Hieracium* there is little fixity of type in any of the vegetative or floral organs, and differences in these organs are commonly not so much absolute differences as differences of degree. Complete series of transitional forms may be found in every organ of the plant, in habit of growth, leaf-form, character and distribution of indumentum, glandular development, form of inflorescence, and structure of the alveoles or pits of the receptacle. The transitions of one organ are usually not homologous with those of another, and so an infinity of cross-affinities is produced, and the series of transitions in different organs give rise to an indefinite number of combinations of characters which renders it generally difficult to define accurately either large or small groups throughout the genus. Fries evolved a system of generic subdivisions with a number of subsidiary species when relatively few of the multitude of existing forms were known or even suspected, and his subgeneric and specific definitions are now realized to be very imperfect. So much so, that the diagnoses of his generic subdivisions are found to need constant amendment, and it is not easy, and sometimes impossible, in the absence of adequate type-specimens, to understand exactly what, in a modern sense, his species actually were. Zahn, dealing with an infinitely greater number of forms, has endeavoured to achieve greater accuracy by clearly though concisely defining his subgeneric groups and then referring to those groups only such species as he considers are really covered by the group diagnoses. By doing this he leaves outside the defined groups a larger number of species than he is able to include within them, and these excluded species he places as 'intermediate species' (zwischenarten) or hybrids in juxtaposition with one or other of the groups to which he considers them to be related. In the case of *Eu-Hieracium* the intermediate species are very numerous while the number of hybrid species is very much smaller, and markedly less, relatively, than in *Pilosella*. This contrast seems to indicate an important biological difference between the two subgenera which might help to furnish grounds for their complete generic separation.

Zahn's species, whether within or without the subgeneric groups, are generally aggregate or capital species, often including very many and occasionally even hundreds of subspecies. In constructing these aggregate species he has had to examine the literature and available material of a large part of the Eurasian region of the world, with the occasional addition of temperate North America, and his conclusions, necessarily broadly drawn, are not invariably what a worker, dealing with a more limited region, might expect. Thus it is not easy at times to understand his selection of types for his aggregate species, or the composition of their sub-species, as, for example, in the cases of the French *H. Mougeotii* Froel. and the Pyrenean *H. olivaceum* G. & G., which represent two aggregate species with *H. iricum* Fr. and *H. anglicum* Fr. included as subspecies under the former, and *H. anglicum* var. *jaculifolium* Hanb. and var. *calcaratum* Lint. under the latter. The sinking of *H. lingulatum* Backh. under an aggregate *H. nigrescens* Willd., while *H. senescens* Backh. becomes a separate capital species, seems equally unacceptable ; and other instances among British plants might be cited. Such occasional discrepancies are probably inseparable from a work of the magnitude of the Monograph.

While the system adopted by Zahn of clearly defined generic subdivisions with excluded intermediate species, and composite, often very large capital species within and without the subdivisions, may be the best that can be devised for an account of the whole genus, and may best represent its evolution, yet it is not necessarily the most useful in a text-book treating of only a part of the genus. It does not permit a dichotomous arrangement of the whole of the species or sub-species, and therefore, loses value as an aid to the determinations of specimens.

The present Prodrômus is intended to be a descriptive account of such hawkweeds as have hitherto been distinguished in Britain, together with certain others whereof adequate material has fallen under the writer's notice, and is drawn up in such a way as presumably to be most useful for further study of the genus. With this end in view a dichotomous classification becomes essential. Zahn's system of intermediate species outside the generic subdivisions will therefore not be followed, and while these subdivisions will be maintained, others will be framed, as necessary, to embrace the excluded species. That there will be many future additions to the forms now described is certain, for an appreciable number are already known, especially among the *Phyllopoda* of *Eu-Hieracium*, that must await the collection of more or better material. Some of these are alluded to in the text.

It must be remembered that in nature the subgeneric sections do not follow any linear sequence, and so, in whatever order they may be arranged, such order must be more or less arbitrary. In the 'Student's Flora' (ed. 3, p. 232) Hooker states that 'variable as the genus is, the sequence of its forms [from *alpinum* to *boreale* inclusive] is so natural as to have been recognized by all botanists'. This statement seems accurate only in respect of the habit of growth—the transition from a phyllopodous condition with a single-headed scape to an aphyllopodous one with a leafy stem bearing a many-headed cyme—and is applicable only to certain sections of *Eu-Hieracium*. Leaf form, indumentum and glandular development, as well as the construction of the receptacle-pits do not follow this type of sequence. In modern European Floras the sequence of growth-habit has often been followed as a matter of convenience, and it has recently been adopted by Omang in Ostenfeld and Grøntved's 'Flora of Iceland and the Faeroes' (1934). It is suitable in some degree for an account of the British forms, for we have no species of *Barbata* to be confused with the *Alpina*, and species exist in Britain which connect the *Alpina* with the *Cerinthoidea* and *Oreadea*. This form of sequence will therefore be mainly followed. The *Alpina*, however, are related by their foliar glands to the *Amplexicaulia*, where this feature is much more obvious. The *Amplexicaulia* have no close relationship with other British groups, and they and the *Alpina*, as plants with glandular foliage, will be placed first in this work. Allied to the true *Alpina* are several British species which are treated by Zahn as intermediate between *H. alpinum* L. on the one hand and *H. pallidum* Biv.-Bern., *H. murorum* L. or *H. bifidum* Kit. on the other. These will be placed in a succeeding Section *Subalpina*. *H. anglicum* Fr. and *H. iricum* Fr., though shown in Section *Cerinthoidea* of Fries's *Epicrisis*, are regarded by Zahn as intermediate forms between *H. cerinthoides* L. and *H. murorum*, and with their allies are excluded from his Section *Cerinthoidea*. This treatment seems scarcely justified and the original arrangement of Fries is here followed. The Section *Oreadea* itself calls for no comment, but a large number of British species that present Oreadean features in a modified degree are placed by Zahn under aggregate species that he considers not Oreadean but intermediates between *H. pallidum* on the one side and *H. murorum*, *H. vulgatum* or *H. bifidum* on the other. These are brought together here under a Section *Sub-Oreadea*. Under the next Section *Vulgata*, the largest and most difficult of the subgenus, ninety-five specific names are printed in the current London Catalogue. Zahn places most of these plants under five aggregate species within the Section, *H. murorum*, *H. sagittatum* Lindbg., *H. vulgatum*, *H. bifidum* and *H. caesium* Fr., while he treats the remainder under other aggregates, *H. diaphanoides* Lindbg., *H. laevicaule* Jord., *H. subramosum* Lönnr., *H. angustatum* Lindbg. and *H. maculatum* Sm., which are regarded as intermediates between the foregoing five species or between these and members of other Sections. This arrangement is here modified by the substitution of six Subsections under Section *Vulgata*, viz.:—(1) *Bifida*, (2) *Stellatifolia* (plants with floccose foliage), (3) *Glandulosa* (*H. murorum* * *silvaticum* Fr.), (4) *Sagittata*, (5) *Caesia*, (6) *Eu-Vulgata*. The subspecies of Zahn's intermediate capital species are distributed among these Subsections. The *Alpestris*, which are merged by

Zahn with the *Prenanthoidea*, are here treated as a separate Section, for they lack the most distinctive feature (pale achenes) of that small but characteristic group. The *Tridentata* follow the arrangement of Zahn. These three last-named Sections, in which the habit of growth fluctuates between phyllopody and aphyllpody, are placed together as a group *Transitoria*. The British plants referred to the *Foliosa* by W. R. Linton are excluded from the group of this name by Zahn and treated under two intermediate species equivalent to *Prenanthoidea-Tridentata* and *Prenanthoidea-Umbellata*. This seems an unnatural arrangement, and Linton's Section *Foliosa* (excluding *H. boreale* Fr.) is adopted. This, with the two further Sections *Umbellata* and *Sabauda*, as maintained by Zahn, forms the group *Aphyllpoda*. The relatively small Subgenus *Pilosella*, as found in Britain, is divided into four Sections *Pilosellina*, *Auriculina*, *Pratensina*, and *Præaltina*, as defined by Zahn. Only one species, *H. flagellare* Willd., presents really intermediate characters, and this is placed for convenience with the *Pratensina*, which it most nearly resembles.

The rank of subspecies is not adopted in this work. A number of subspecies brought together under an aggregate species are usually presumed to have a genealogical relationship and a common origin. In the case of *Hieracia*, as treated by Zahn, this linkage is sometimes not only unproven but improbable; and it is more likely that more or less similar forms inhabiting different countries have frequently been independently evolved, and that their resemblance is accidental. The plea of convenience for the grouping of subspecies under capital species, which has force in the case of a great monograph, is weakened when a relatively small number of forms are affected, and it seems best in a handbook to treat all the forms that show no evident relationship to others as individual species or micromorphs. Moreover, the degree of distinct individuality varies widely in different forms, as does also their geographical distribution, some ranging over wide areas in Europe while others are known only from a single restricted station in this country.

It will be seen that many past identifications of British with Scandinavian forms are not accepted, the plants generally being found clearly to differ in one or more particulars. Dahlstedt and other Scandinavian hieraciarchs, when reporting on British specimens referred for their opinion, frequently pointed out that they did not exactly agree with the species whose names they suggested. Nevertheless, these names were generally taken up. Many of our British plants seem to produce noticeably finer heads of flowers than the Scandinavian species which they most resemble, and this is specially true of some Yorkshire species. And among the *Tridentata* the British plants are frequently of coarser growth with broader foliage. The prevalence of hawkweeds with dark or blackish involucre is a peculiar feature of the Moffat district of southern Scotland. It has been observed on more than one occasion, among plants of the Section *Vulgata*, that while definite, well-marked forms are predominant over more or less wide areas in the subalpine districts of Central Europe, to the nearly complete exclusion of allied forms, yet among the hills of Northern Britain, a mixture of species may commonly be noticed, all growing in comparatively small quantity with no single form dominant.

HAWKWEEDS IN CULTIVATION.

Many of our British Hawkweeds are attractive plants and some are very suitable for the garden. Backhouse and Hanbury evidently loved the species of the Section *Alpina*, and I, too, must admit a weakness for gathering any specially fine specimens of this group, or of the superficially similar *Barbata*, either on the Scottish hills or among the Alps. *H. anglicum*, growing along rocky river banks or on mountain ledges, is also a truly handsome plant, and the same may be said of several of the Cerinthoidæan or Oreadean species. Some Aphyllpodos species, like *H. Listeræ* or *H. maritimum*, are also distinctly attractive. Under cultivation different hawkweeds behave very diversely. Plants of the *Alpina* group have never flourished in my small garden at Wimbledon, slugs devouring them in early spring though they

rarely touch any other species. Hanbury, however, was able to grow luxuriant examples of some of this Section in his garden at Clapton, in north-east London, and Backhouse, too, seems to have cultivated them successfully at York. Species of other British groups have flourished well enough in my garden. Some, especially *Oreadea*, change but little under cultivation, while others, as the *Cerinthoidea*, and some of the *Vulgata* and *Tridentata*, develop a coarse habit of growth with unduly numerous but poorly grown flower-heads. *H. britanniciforme*, of the Great Orme's Head, once known as "cabbage *H. caesium*", is a beautiful garden plant at Wimbledon, with fine foliage and large, showy heads. The narrow, caesious foliage and clear yellow heads of *H. decolor*, the broad, dark green leaves and fine panicle of deep golden flowers of *H. auratiflorum*, and the yellowish green rosettes and floriferous panicles of *H. itunense*, with its blackish involucre and deep yellow ligules, are almost equally fine for the border or rock-garden. Other ornamental species are *H. hypochaeroides* and *H. praecox* with their elaborately spotted leaves; and *H. cambricum* may be grown as an interesting novelty, for it keeps its dwarf stature and other characteristics perfectly even in a suburban garden. *H. aurantiacum* and *H. brunneocroceum*, of the Subgenus *Pilosella*, are always worthy of a place in the border for the peculiar and striking colour of their flower-heads.

The phyllopodous species of the Subgenus *Eu-Hieracium* are long-lived plants, which, in a wild state, are not aggressive and do not usually grow in profusion. Many of them are distinctly rare. An individual plant of *H. cambricum*, brought from the Great Orme more than twenty years ago, is still flourishing in my rock-garden, and examples of other species growing there are nearly as old. With increasing age the rootstock becomes elongate and branched, and botanists, when obtaining wild specimens, often carelessly tear up and destroy whole plants, when sufficiently complete examples for the herbarium could be secured by cutting off the portions of the rootstock bearing the radical rosettes and inflorescence. The intermediate and aphyllopodous species also are, for the most part, local, and grow more or less sparingly, but a few, particularly of the *Sabauda* group, sometimes occur in profusion on railway banks, colliery débris, and other made-up ground.

The polymorphism of the genus has sometimes been attributed largely to hybridity, but, at least in *Eu-Hieracium*, this seems scarcely borne out by experience in the garden. In his introduction to 'The British Hieracia' W. R. Linton states that at Shirley, in Derbyshire, where over one hundred forms of hawkweeds were cultivated for many years, and the plants allowed to grow and sow their seed in close proximity to each other, no hybrid individual was ever noticed; and further, that those sown by hand came true to type, and those that sprang up naturally were always identical with one or other of the forms already cultivated. My own experience at Wimbledon, where British hawkweeds have been grown for over twenty years, has been very similar. There have generally been about thirty species in my garden at any one time, growing more or less intermingled, and these have often been allowed to shed their seed naturally. Seedlings have come up promiscuously in large numbers every year, and almost always they could be identified with their parent species as soon as four or five leaves beyond the cotyledons were developed. I never noticed an individual that appeared to be a hybrid. The only way in which any of my seedlings differed from their parents was in the rare production of stylose instead of ligulate florets. This happened once with *H. rubicundum*, and I obtained a second generation of stylose-flowered plants in this case; and on one or two occasions with *H. anglicum*. A ready way to increase any particular form is to sow the seeds in pots immediately they can be blown from the head, when every seed usually quickly germinates. Although hybridity in cultivated hawkweeds of the Subgenus *Eu-Hieracium* is at least unusual, and parthenogenetic reproduction is now known to be general, yet natural hybrids are almost certainly very occasionally found. They probably owe their origin to the visits of bees, which I observed to be frequently attracted to the flowers at Wimbledon. It has also been stated, on authority that can scarcely be

disputed, that hybrids have been artificially produced. The phenomenon of parthenogenesis can be easily tested by removing the styles, with their anthers, from a flower-head just before anthesis; the fruits will be found to continue their development unaffected and to produce fertile seed.

In the subgenus *Pilosella*, natural hybrids seem to be of frequent occurrence on the Continent, where many species are to be found; but in this country hybridization has apparently not been noticed, although it may sometimes be responsible for some of the fortuitous variations to be seen in *H. Pilosella*.

NOTABILIA.

The production of this *Prodromus* has been seriously affected by the war. The writing of the text was begun in 1936, and the descriptions of the phyllopodous species of *Eu-Hieracium* were finished during the winter of 1938-39. The work was mainly based on the collections in the Natural History Museum at South Kensington, together with my own herbarium. The material at the Museum was very extensive, embracing not only the normal herbarium, but the Boswell-Syme and Hanbury collections* as well as those of E. F. Linton, Arthur Bennett, H. and J. Groves, W. C. Barton, H. J. Riddelsdell, C. E. Salmon and others, which had relatively recently been bequeathed to the state and not yet incorporated in the herbarium proper. In addition the plants of the Kew herbarium and those at the South London Botanical Institute were utilized; and the Irish collection of the Dublin Museum, as well as the Orkney and Forfar gatherings of Col. H. H. Johnston and R. H. Corstorphine respectively were placed at my disposal. The Druce herbarium at Oxford was also consulted. The collation of this scattered material involved considerable work. The invaluable Sloane Herbarium was unfortunately not examined for early records before the war rendered it inaccessible. On the outbreak of war in September, 1939, the removal of the European and British collections at South Kensington from their permanent gallery made their consultation for the time being impossible, and as the relevant literature also was in great part no longer available, all work on the *Prodromus* was suspended. A year later the main botanical gallery of the Museum was damaged by enemy action, and the Hanbury collection with other important specimens of *Hieracia* were sent *inter alia* for safety from South Kensington to the Zoological Museum at Tring. My own herbarium also went there, my house at Wimbledon having been rendered uninhabitable at the same time. In 1941, as the account of the phyllopodous hawkweeds already written included over fifty new species or new specific names, and numerous specimens sent for naming were being held up pending their publication, a paper was printed in the 'Journal of Botany', with abbreviated Latin diagnoses where necessary, to validate the new names. There being no prospect of an early end to the war, it was resolved in the autumn of the same year to resume the work on the *Prodromus* at Tring, relying largely on the Hanbury herbarium. The body of the work was completed in April, 1943.

In the case of the new species of the group *Phyllopoda*, which were published in the 'Journal of Botany', the original full Latin diagnoses have been retained in the *Prodromus* as the abbreviated diagnoses printed were intended solely to be sufficient to validate the new names, and full diagnoses corresponding with those in the later new groups are clearly desirable.

The descriptions throughout have been drawn up from series of exsiccatae selected to show the plants' normal range of variation, but it must not be expected that the accounts of all the species and varieties will cover any specimen that may be met with. In plants as susceptible to environment as *Hieracia*, any attempt at such all-embracing descriptions would render them unduly lengthy and probably not readily intelligible. The student must be expected to possess some general knowledge of the possible variations to be found, and when he sees individuals of a species like *H. boreale* ranging from tall, leafy-stemmed plants on rich soil, with large panicles

* The Hanbury collection includes the *Hieracia* from Backhouse's herbarium.

of flower-heads, to dwarfs on a neighbouring dry wall with perhaps three or four narrow leaves and a solitary head, to have sufficient intelligence to realize that they are not two different species of separate groups. Similarly the effect of cultivation in rich garden soil and sheltered surroundings may be remarkable, and it is perhaps wise for a beginner to confine his studies to the wild plants. Different hawkweeds are not always similarly affected by cultivation—a phenomenon that might be made an interesting and profitable subject for investigation.

The nomenclature adopted is intended to be in accordance with the International Rules, as last revised by the Congress at Amsterdam in 1935—a desideratum not always readily attainable. The Rules direct one sequence of rank from the species downwards, i.e., subspecies, varieties, subvarieties and forms; and the rejection of all later homonyms, whether the earliest names are valid or not, or relegated to other genera. The distinction between the species, subspecies and varieties of the Scandinavian authors is sometimes involved, and Rouy's 'Flore de France' admits races, forms and other units of species which are of higher rank than subspecies. The rank of Arvet-Touvet's names also is often questionable. Zahn's capital species are really generic series or greges, and his subspecies are the species of many authors and of this Prodrömus. The method of maintaining segregate species has involved certain nomenclatural changes, for some names which Zahn has altered owing to the existence of earlier subspecific epithets have been restored, a species and a subspecies being regarded as of different taxonomic rank for this purpose. On the other hand, some names which Zahn perpetuated under former Rules have been suppressed as later homonyms of groups which have been transferred to other genera. Where groups above varietal rank (usually French) not falling within the recognized hierarchy of names have been dealt with, they have generally been regarded as species for the purposes of nomenclature. New specific epithets that would clash with existing subspecific ones have been avoided. In a number of cases where Zahn's subspecific names appear to have been first shown as species in the eleventh edition of the 'London Catalogue of British Plants', they are cited as '(Zahn) Roffey in Lond. Cat. ed. xi', although the names for species may be said to be merely nomina nuda. Owing to the difficulty of collating the necessary literature under war-time conditions some discrepancies in nomenclature will probably be discovered, but the general aim has been to make the names as accurate as possible under the existing rules, remembering, however, that nomenclature should be the handmaid of taxonomy, and not an instrument for the exercise of verbal gymnastics and the undue propagation of the 'comb. nov.', a term strangely unmentioned in the International Rules.

The general distribution of the species has usually been taken from Zahn's Monograph.

The sets of exsiccatae utilized in connection with this work are mainly the following :—

- E. Fries : *Hieracia Europaea Exsiccata*. 1862–1865.
- C. J. Lindeberg : *Hieracia Scandinaviae Exsiccata*. Fasc. i, 1–50 (1868) ; Fasc. ii, 51–100 (1872) ; Fasc. iii, 101–150 (1878).
- A. Peter : *Hieracia Naegelianae Exsiccata*. Cent. i–iii (1884).
- H. Dahlstedt : *Hieracia Exsiccata*. Fasc. i–iii, 1–300 (1889) ; Fasc. iv, 301–400 (1891).
Herbarium Hieraciorum Scandinaviae. Cent. i–xiii (1892–1901).
- H. Sudre : *Herbarium Hieraciorum*. Fasc. i–vi, 1–300.
- E. F. and W. R. Linton : *Set of British Hieracia*, nos. 1–160 (1896–1901) ; nos. 161–185 (1906).

Of these exsiccatae the most valuable are those issued by Dahlstedt, which seem to be uniformly homogeneous. The 'Hieracia Exsiccata' are in the Natural History Museum and with the Hanbury collection ; the later 'Herbarium Hieraciorum Scandinaviae' is at Kew. Lindeberg's sets are almost equally important, and their

material is usually well chosen and homogeneous. Sudre's exsiccatae have been utilized chiefly for the species of the *Sabauda* and are less satisfactory; some of the specimens seem to have been collected too late in the season. The British plants sent out by the brothers Linton are inferior to the foreign sets. They are commonly made up of wild and cultivated specimens, not unfrequently from different habitats, and, as already remarked, there are many instances where different forms have been mixed. Some of these are alluded to under the species concerned.

The specimens cited as exsiccatae and those shown in the distribution lists under each species have been examined in every case, and are mostly to be found in the Natural History Museum. No published records have been utilized. Where I have myself collected the plant *in situ*, a note of exclamation follows the place-name in the distribution list. The complete list of stations in each vice-county is not necessarily given, and no attempt has been made uniformly to select the earliest records. The simplest terms possible have been used in the descriptions, and the Latin is modelled on that of Zahn's Monograph. Unnecessary and fantastic appellations, sometimes of obscure meaning, such as appear in Williams's work, have been avoided. 'Ex parte' or 'pro parte' appears in the synonymy of species in the formerly generally accepted sense; i.e., where the synonym includes more (ex parte) or less (pro parte) than the group described.

HIERACIUM.

HIERACIUM L. Genera Plantarum, 240 (1737); Species Plantarum, 799 (1753), emend. Tausch, Bemerkungen über Hieracium in Flora, xi (1828); J. Backhouse, Mon. British Hieracia, 9 (1856); E. Fries, Epierisis Generis Hieraciorum, 5 (1862); F. N. Williams, Prodrum Flora Britannicae, iii. 76 (1902); K. H. Zahn, Compositae-Hieracium in Engler, Pflanzenreich, iv. 280 (1921-1923).

Perennial herbs with \pm milky juice. Rootstock descending, oblique or horizontal, with thick fibres. Shoot forming either a basal rosette, developing a scape or few-leaved stem, and sometimes also stolons, or a leafy stem without basal rosette. Cauline leaves alternate. Inflorescence varying from a one-headed scape to a many-headed, paniculate cyme. Stem, leaves and inflorescence clothed with pilose hairs, stalked or sessile glands and stellate pubescence in varying proportions. Phyllaries of the involucre \pm irregularly imbricated in several series, the outer nearly always shortest and gradually passing into the inner. Receptacle pitted, the pits with scarious, denticulate to dentate, or sometimes fimbriate margins. Florets normally all ligulate, bright yellow (rarely pale yellow or red), \pm hirsute externally round the throat and sometimes about the apex and even the back of the five-toothed ligules. Achenes 1.5-4.5(-5) mm. long, cylindrical, 10-ribbed, truncate, not beaked; pappus-hairs simple, rigid, usually dirty white to fulvous.

Distribution (excluding subgenera *Stenotheca* and *Mandonia*).—Temperate and subarctic regions of the Northern Hemisphere.

Subgenus *EU-HIERACIUM* Torrey and Gray, Fl. North America, ii. 475 (1838-40); Zahn, l. c. 33 (1921); *Archieracium* Fries, l. c. 6 and 42 (1862); Williams, l. c. 77 (1902); W. R. Linton, British Hieracia, 1 (1905); Rouy, Flore de France, ix. 234 (1905).

Rootstock never stoloniferous. Leaves entire to lacinate-dentate. Heads 15-35 (-50) mm. in diameter when expanded. Ligules never red nor marked with red

on the back. Achenes (2.5-)3-4.5(-5) mm. long, brown or blackish, rarely pale-coloured, the ribs apically confluent in an obscure ring; pappus-hairs sub-biseriate, with long and shorter, rigid, often finely denticulate bristles intermixed.

Distribution.—Europe, North-west Africa, Northern Asia, North America.

Conspectus of Species.

A. PHYLLOPODA Godet, Fl. Jura, 421 (1852).

Aurella and *Pulmonarea* Fries, Epicr. 6, 42 and 74, excl. *Alpestris* (1862).

Plants producing radical rosettes of leaves which persist until the time of flowering; cauline leaves 0 or relatively few, and so the foliage wholly or chiefly radical. Innermost phyllaries the most acute.

Sect. I. **Amplexicaulia**. (See page 35.)

Cauligerous plants. Foliage clothed with stalked glands, with or without pilose hairs. Inflorescence racemose- to paniculate-corymbose, with large heads. Phyllaries incumbent in bud. Ligules pilose-tipped. Margins of receptacle-pits dentate-fimbriate.

1. *H. amplexicaule*. 2. *H. pulmonarioides*. 3. *H. speluncarum*.

Sect. II. **Alpina**. (See page 37.)

Scapigerous plants. Foliage pilose and sparingly clothed with fine, stalked glands, at least on the margins. Stem-leaves 0-4, narrow and \pm bractlike. Heads solitary or very few, \pm large. Phyllaries incumbent in bud. Ligules pilose-tipped. Margins of receptacle-pits shortly dentate.

Series *Genuina*.

Leaves \pm narrow, attenuate below. Heads long-pilose. Ligules pilose on the back as well as at the tips.

4. *H. alpinum*. 5. *H. holosericeum*. 6. *H. Grovesii*. 7. *H. eximium*. 8. *H. calenduliflorum*. 9. *H. macrocarpum*. 10. *H. graniticolum*.

Series *Nigrescentia*.

Leaves often broader and more toothed, less attenuate below. Heads blacker, more shortly pilose. Leaves usually pilose-tipped only.

11. *H. gracilentum*. 12. *H. globosiflorum*. 13. *H. pseudo-petiolatum*. 14. *H. Backhousei*. 15. *H. pseudo-curvatum*. 16. *H. nigrescens*. 17. *H. Hanburyi*. 18. *H. subgracilentipes*.

Sect. III. **Subalpina**. (See page 53.)

Scapigerous plants. Foliage pilose, usually with a few stalked glands on the margins. Stem leaves 1-4, \pm lanceolate, narrowed below. Inflorescence racemose-corymbose with few \pm large heads, which are varyingly pilose and glandular. Phyllaries incumbent or porrect in bud. Ligules generally pilose-tipped. Margins of receptacle-pits usually shortly or subulate-dentate.

Series *Senescentia*.

Heads \pm large, dark, pilose and glandular.

19. *H. lingulatum*. 20. *H. molybdochroum*. 21. *H. Marshallii*. 22. *H. cremnanthes*. 23. *H. sinuans*. 24. *H. senescens*. 25. *H. pseudanglicum*.

Series *Atrata*.

Heads of medium size, dark, densely glandular.

26. *H. gracilifolium*. 27. *H. submurorum*. 28. *H. cumbriense*. 29. *H. centripetale*.

Series *Hyparctica*.

Heads of medium size, attenuate below. Ligules pilose- or glabrous-tipped.

30. *H. hyparcticoides*. 31. *H. Isabellae*.

Series *Callistophylla*.

Heads of medium size, rounded below, densely pilose. Ligules glabrous-tipped.

32. *H. callistophyllum*. 33. *H. dasythrix*.

Sect. IV. **Cerintholdea**. (See page 67.)

Foliage pilose, eglandular, generally \pm glaucous; radical leaves usually \pm cuneate-based; cauline often semi-amplexicaul. Inflorescence racemose- or subcorymbose, with \pm large, densely pilose heads. Phyllaries usually incumbent in bud. Ligules pilose-tipped. Styles generally livid. Margins of receptacle-pits dentate, \pm fimbriate.

Series *Anglica*.

Scapigerous plants, with 0-few stem-leaves. Inflorescence generally lax, with 1-few heads.

34. *H. anglicum*. 35. *H. brigitum*. 36. *H. ebudicum*. 37. *H. hebridense*. 38. *H. ampliatum*. 39. *H. petrocharis*. 40. *H. langwellense*. 41. *H. flocculosum*. 42. *H. Shoolbredii*.

Series *Irica*.

Cauligerous plants, with 3-several stem-leaves. Inflorescence subcorymbose, with 1-20 heads.

43. *H. iricum*. 44. *H. scarpicum*.

Sect. V. **Oreadea**. (See page 82.)

Foliage \pm setose (especially about the margins), eglandular, often glaucous, narrowed below; cauline leaves not semi-amplexicaul. Inflorescence \pm furcate-corymbose, with medium to large heads, less pilose than in Sections II.-IV. Phyllaries normally porrect in bud. Ligules generally glabrous-tipped. Styles usually yellow. Margins of receptacle-pits subulate-dentate, rarely fimbriate.

Series *Pallida*.

Scapigerous plants, with normally 0-1(-2) stem-leaves.

45. *H. lima*. 46. *H. lasiophyllum*. 47. *H. eustomon*. 48. *H. Schmidtii*. 49. *H. Levi*.

Series *Argentea*.

Scapigerous plants, with less setose, generally narrower, and sometimes spotted foliage; stem-leaves usually 1-2.

50. *H. nitidum*. 51. *H. basicrinum*. 52. *H. Sommerfeltii*. 53. *H. carneddorum*. 54. *H. argenteum*. 55. *H. vagense*. 56. *H. cambricum*.

Series *Eu-Oreadea*.

Cauligerous (sometimes hypophyllopodous) plants, with 2-several stem-leaves ; setae usually clothing the upper leaf-surface.

57. *H. Griffithii*. 58. *H. deganwyense*. 59. *H. buglossoides*. 60. *H. scoticum*. 61. *H. chloranthum*. 62. *H. Beebyanum*. 63. *H. orimeles*.

Sect. VI. **Sub-Oreadea**. (See page 103.)

Scapigerous plants, with \pm glaucous, eglandular, rounded- or truncate-based leaves, and less setiform hairclothing than in Section V. Inflorescence and heads as in Section V. Ligules glabrous- or pilose-tipped. Styles and receptacle-pits as in Section V.

Series *Caledonica*.

Leaves \pm rounded below. Phyllaries incumbent in bud, broad, obtuse.

64. *H. rubicundum*. 65. *H. caledonicum*.

Series *Hypochaeroides*.

Leaves \pm truncate- or rounded-based, sometimes spotted. Phyllaries porrect in bud, usually narrower and less obtuse.

66. *H. pseudo-repandum*. 67. *H. Riddelsdellii*. 68. *H. basalticolum*. 69. *H. Jovimontis*. 70. *H. cyathis*. 71. *H. hypochaeroides*. 72. *H. subplanifolium*. 73. *H. britannicum*. 74. *H. dasypodium*. 75. *H. britanniciforme*. 76. *H. clovense*. 77. *H. fratrium*.

Sect. VII. **Vulgata**. (See page 119.)

Scapigerous or cauligerous plants. Foliage usually softly pilose, eglandular, rarely glaucous ; the radical leaves with cuneate to truncate or subcordate base, the cauline not semi-amplexicaul. Inflorescence furcate- to paniculate-corymbose, few to many-headed. Heads large to very small, with variously clad, generally incumbent phyllaries. Ligules glabrous- or pilose-tipped. Styles usually fuscous to livid. Margins of receptacle-pits nearly edentate to \pm subulate-dentate, rarely dentate-fimbriate.

Subsect. **Bifida**. (See page 120.)

Scapigerous plants, generally \pm glabrescent ; radical leaves green or glaucescent, subcordate- to cuneate-based ; stem-leaf 0-1. Heads medium or large, with floccose, pilose and sparingly glandular phyllaries. Ligules glabrous- or rarely pilose-tipped. Margins of receptacle-pits \pm dentate.

Series *Sanguinea*.

Leaves broad-based. Inflorescence \pm furcate-corymbose, generally with large heads.

78. *H. pachyphyllum*. 79. *H. sanguineum*. 80. *H. tricolorans*. 81. *H. subcyaneum*.

Series *Eu-Bifida*.

Leaves with \pm rounded to cuneate base. Inflorescence paniculate-corymbose with medium heads.

82. *H. silvaticoides*. 83. *H. maculosum*. 84. *H. pseudo-sarcophyllum*. 85. *H. anguinum*. 86. *H. neocoracinum*. 87. *H. prolixum*. 88. *H. subtenue*.

Series *Aggregata*.

Leaves cuneate-based. Inflorescence \pm subumbellate, with medium heads.
89. *H. aggregatum*. 90. *H. oxyodus*.

Subsect. **Stellatifolia**. (See page 132.)

Scapigerous plants with dull-green, floccose foliage; radical leaves \pm truncate-based; stem-leaf 0-1. Inflorescence furcate-corymbose, with medium heads and densely floccose phyllaries. Styles yellow. Ligules glabrous- or pilose-tipped. Margins of receptacle-pits sharply dentate.

91. *H. cillense*. 92. *H. cymbifolium*.

Subsect. **Glandulosa**. (See page 134.)

Scapigerous plants with green, pilose foliage; radical leaves \pm truncate-based; stem-leaf usually 0-1. Inflorescence paniculate- to furcate-corymbose, with small to medium, often \pm radiant heads. Phyllaries strongly glandular, at most moderately pilose. Ligules glabrous- or pilose-tipped. Margins of receptacle-pits \pm dentate, very rarely dentate-fimbriate.

Series *Pellucida*.

Inflorescence paniculate-corymbose; heads small and narrow to very small.

93. *H. praecox*. 94. *H. duriceps*. 95. *H. killinense*. 96. *H. praetenerum*.
97. *H. pellucidum*. 98. *H. Stenstroemii*. 99. *H. exotericum*. 100. *H. cuneifrons*.
101. *H. pulcherrimum*. 102. *H. itunense*.

Series *Ciliatiflora*.

Inflorescence generally less paniculate or furcate-corymbose; heads of medium size, rounded-based.

103. *H. pollinarium*. 104. *H. pictorum*. 105. *H. pollinarioides*. 106. *H. caliginosum*. 107. *H. subprasiniifolium*. 108. *H. pseudo-Stenstroemii*. 109. *H. longilobum*. 110. *H. semi-crassiceps*. 111. *H. ciliatiflorum*. 112. *H. varicolor*. 113. *H. dipteroides*.

Subsect. **Sagittata**. (See page 157.)

\pm Scapigerous plants with green, pilose foliage; radical leaves with subtruncate, sagittate or shortly contracted base; stem-leaves 0-2. Inflorescence \pm paniculate-corymbose, with rather small to rather large heads. Phyllaries pilose, usually finely glandular. Ligules glabrous- or shortly pilose-tipped. Margins of receptacle-pits dentate or dentate-fimbriate.

Series *Eu-Sagittata*.

Leaves with subtruncate or sagittate base. Margins of receptacle-pits \pm dentate.

114. *H. oistophyllum*. 115. *H. pyenodon*. 116. *H. subhirtum*. 117. *H. rivale*.
118. *H. uisticolum*. 119. *H. breadalbanense*. 120. *H. crebridentiforme*.
121. *H. auratiflorum*. 122. *H. Lintonii*.

Series *Fimbriata*.

Leaves shortly narrowed below. Margins of receptacle-pits dentate-fimbriate.

123. *H. euprepes*. 124. *H. orcadense*. 125. *H. clivicolum*.

Subsect. **Caesia**. (See page 169.)

Cauligerous (sometimes hypophyllopodous) plants with glaucescent or green, \pm pilose foliage; radical leaves \pm cuneate- or rarely sagittate-based; stem-leaves 1-3(-5). Inflorescence usually \pm furcate-corymbose, with generally few, small to large heads. Phyllaries floccose, pilose (often shortly) and glandular. Ligules glabrous- or pilose-tipped. Margins of receptacle-pits generally dentate to subulate-dentate.

Series *Angustata*.

Heads dark or blackish green, sparingly floccose. Ligules usually glabrous-tipped.

126. *H. angustatum*. 127. *H. rhomboides*. 128. *H. melanochloricephalum*.
129. *H. stenophyes*. 130. *H. vennicontium*. 131. *H. anfractiforme*.

Series *Dissimilia*.

Heads usually olive- or dark green, floccose, \pm densely pilose. Ligules generally \pm pilose-tipped.

132. *H. caesiomurorum*. 133. *H. dissimile*. 134. *H. subramosum*. 135. *H. orarium*. 136. *H. cravoniense*. 137. *H. rubiginosum*.

Series *Eu-Caesia*.

Heads greyish green, densely floccose, rarely \pm densely pilose. Ligules usually glabrous-tipped.

138. *H. caesiopilosum*. 139. *H. decolor*. 140. *H. fulvocaesium*. 141. *H. erythraeum*. 142. *H. farrense*. 143. *H. proximum*. 144. *H. angustisquamum*.
145. *H. eustales*. 146. *H. insulare*. 147. *H. Leyianum*. 148. *H. holophyllum*.

Subsect. **Eu-Vulgata**. (See page 192.)

Cauligerous (often hypophyllopodous) plants with (often dull) green, pilose foliage; radical leaves \pm cuneate-based; stem-leaves (1-)2-6, or rarely more. Inflorescence paniculate-corymbose, with few to many, medium to small heads. Phyllaries variously floccose, pilose and glandular. Ligules usually glabrous-tipped. Margins of receptacle-pits obscurely to subulate-dentate.

Series *Genuina*.

Phyllaries with \pm numerous pilose and glandular hairs.

149. *H. vulgatum*. 150. *H. acroleucum*. 151. *H. neopinnatifidum*. 152. *H. lepidulum*. 153. *H. maculatum*. 154. *H. Roffeyanum*. 155. *H. surrejanum*.
156. *H. megapodium*. 157. *H. subamplifolium*. 158. *H. subminutidens*.

Series *Sciaphila*.

Phyllaries glandular, normally epilose.

159. *H. diaphanum*. 160. *H. praesigne*. 161. *H. diaphanoides*. 162. *H. rectulum*. 163. *H. pulchrius*. 164. *H. submutabile*. 165. *H. daedalolepioides*.
166. *H. anglorum*. 167. *H. tunbridgensis*. 168. *H. Lachenalii*. 169. *H. strumosum*.
170. *H. acuminatum*.

B. TRANSITORIA Sectionum Grex nov.

Accipitrina Pseudopulmonarea Fries, Epier. 113 (1862), pro maj. parte.

Plantae habitu intermediae vel variabiles, hypophyllopodae, pseudophyllopodae vel aphylllopodae, rarissime vere phyllopodae. Folia eglandulosa. Squamae intimae acutae ad obtusae.

Plants of intermediate or variable habit of growth, hypophyllopodous, pseudo-phyllopodous or aphyllopodous, very rarely truly phyllopodous. Leaves eglandular. Innermost phyllaries acute to obtuse.

Sect. VIII. **Alpestris.** (See page 219.)

Leaves green, the cauline semi-amplexicaul. Inflorescence generally racemose-corymbose and few-headed, often with branches from the upper leaf-axils. Phyllaries incumbent in bud, usually dark and nearly effloccose, generally all obtuse. Ligules glabrous- or pilose-tipped. Styles yellow to livid. Margins of receptacle-pits \pm subulate-dentate, very rarely dentate-fimbriate. Achenes blackish brown.

Series *Dovrensia*.

Stem-leaves few (2-7), lanceolate to ovate-lanceolate. Ligules usually glabrous-tipped.

171. *H. dovrense*. 172. *H. pulchelliforme*. 173. *H. zetlandicum*.

Series *Protracta*.

Stem-leaves 4-10, narrow, lanceolate-acuminate. Ligules glabrous-tipped.

174. *H. pseudo-protractum*. 175. *H. hethlandiae*.

Series *Subfoliosa*.

Stem-leaves usually broader, more numerous (4-18), never more than shortly petioled. Ligules glabrous-tipped.

176. *H. australis*. 177. *H. subtruncatum*. 178. *H. breve*. 179. *H. prae-thulense*. 180. *H. vinaceum*. 181. *H. northroense*.

Series *Spectabilia*.

Taller plants, with larger, numerous (6-15) stem-leaves and paniculate-corymbose inflorescence. Ligules pilose-tipped.

182. *H. Dewarii*. 183. *H. perthense*.

Sect. IX. **Prenanthoidea.** (See page 230.)

Leaves \pm numerous, green, reticulate beneath, heteromorphous, semi-amplexicaul, the median \pm panduriform. Inflorescence paniculate-corymbose, many-headed, glandular. Heads small, with incumbent, densely glandular, obtuse phyllaries. Ligules pilose-tipped. Styles livid. Margins of receptacle-pits elevated, incise-dentate. Achenes fulvous. Plants tall.

184. *H. prenanthoides*. 185. *H. denticulatum*.

Sect. X. **Tridentata.** (See page 233.)

Leaves \pm numerous, green, with \pm narrowed base and thickened, ciliate or scaberulous margins. Inflorescence racemose- to paniculate-corymbose, with few or many, large or small heads. Phyllaries usually incumbent in bud, obtuse to subacute, rarely densely clothed, often microglandular. Ligules glabrous-tipped. Styles yellow to livid. Margins of receptacle-pits \pm subulate-dentate (rarely fimbriate).

Series *Anomala*.

Leaves long, little toothed. Inflorescence racemose-corymbose, with normally few, rather large heads and obtuse, dark phyllaries. Styles yellow.

186. *H. cacuminum*. 187. *H. hibernicum*.

Series *Gothica*.

Leaves usually narrow, \pm serrate. Inflorescence generally racemose-corymbose and compact, with rarely many heads of medium size to rather large; phyllaries dark, \pm broad, usually obtuse.

188. *H. longiramosum*. 189. *H. cambricogothicum*. 190. *H. boreophilum*. 191. *H. calcaricolum*. 192. *H. fragilicaule*. 193. *H. calviceps*. 194. *H. gothicoides*. 195. *H. uiginskyense*. 196. *H. trinitatis*.

Series *Backhouseana*.

Leaves \pm broad. Inflorescence ample, racemose- to paniculate-corymbose, with \pm large heads and dark, broad, obtuse phyllaries.

197. *H. Backhouseanum*. 198. *H. pseudacrifolium*. 199. *H. Scullyi*. 200. *H. ardaricum*. 201. *H. Stewartii*.

Series *Sparsifolia*.

Leaves narrow to broad. Inflorescence lax to ample, racemose- to paniculate-corymbose, with usually \pm large heads and broad, obtuse, pilose (often densely) phyllaries.

202. *H. subintegrifolium*. 203. *H. stictophyllum*. 204. *H. sparsifolium*. 205. *H. oligodon*. 206. *H. linguans*. 207. *H. substrigosum*. 208. *H. donegalense*. 209. *H. grandescens*. 210. *H. placerophylloides*. 211. *H. Hartianum*.

Series *Eu-Tridentata*.

Leaves numerous, dentate. Inflorescence usually paniculate-corymbose, \pm floriferous, with small to medium (rarely larger) heads; phyllaries generally relatively narrow, rarely very dark, obtuse to subacute. Plants usually tall.

212. *H. tridentatum*. 213. *H. scabrisetum*. 214. *H. cantianum*. 215. *H. nidense*. 216. *H. trichocaulon*. 217. *H. eboracense*. 218. *H. rhayaderense*. 219. *H. lissolepium*.

C. APHYLLOPODA Godet, Fl. Jura, 429 (1852).

Accipitrina Fries, Epier. 7 and 113 (1862) ex parte.

Plants producing leafy, \pm tall stems from closed buds, without any radical rosette, and so the foliage entirely cauline. Leaves eglandular in British species, the lowest often withered at the time of flowering. Phyllaries, even the innermost, obtuse.

Sect. XI. **Foliosa**. (See page 270.)

Leaves numerous, paler and \pm reticulate beneath, sometimes \pm heteromorphous, the upper semi-amplexicaul; margins \pm thickened, ciliate or scaberulous. Inflorescence generally paniculate-corymbose, with many \pm large (rarely few or small) heads. Phyllaries incumbent in bud, \pm glandular, pilose or not, often also microglandular. Ligules usually glabrous-tipped. Styles yellow to livid. Margins of receptacle-pits subulate-dentate, the teeth sometimes setaceous-pointed or fimbriate.

Series *Corymbosa*.

Median leaves \pm elliptic-lanceolate, shortly dentate, with \pm shortly cuneate base. Heads of medium size. Phyllaries sparingly pilose.

220. *H. latobrigorum*. 221. *H. Drummondii*. 222. *H. neocorymbosum*. 223. *H. suberocatum*.

Series *Salicifolia*.

Median leaves \pm elliptic-lanceolate, denticulate, shortly cuneate-based. Heads fewer, of medium size. Phyllaries scarcely pilose.

224. *H. Bartonii*. 225. *H. subpolyphyllum*.

Series *Stricta*.

Median leaves \pm lingulate, subentire to strongly dentate, rounded-based. Heads \pm numerous and large. Phyllaries \pm pilose.

226. *H. reticulatum*. 227. *H. strictiforme*. 228. *H. opsianthum*. 229. *H. Listerae*.

Series *Angusta*.

Median leaves \pm lanceolate, subentire to denticulate-dentate, \pm rounded-based. Heads few to many, small to medium-sized. Phyllaries epilose.

230. *H. pseudamplidentatum*. 231. *H. Bakeranum*. 232. *H. tavense*. 233. *H. pycnotrichum*.

Series *Maritima*.

Median leaves \pm lanceolate, suberect, thick, subentire, rounded-based. Heads few, large. Phyllaries epilose. Plants dwarfer.

234. *H. maritimum*. 235. *H. obesifolium*.

Sect. XII. **Umbellata**. (See page 291.)

Leaves numerous, not reticulate beneath, narrow with \pm attenuate base and recurved, scaberulous margins. Inflorescence subumbellate, at least apically, with normally many medium-sized heads. Phyllaries incumbent in bud, the outer squarrose with \pm reflexed tips, dark or dull green, nearly glabrous. Ligules glabrous-tipped. Styles normally yellow. Margins of receptacle-pits setaceous-dentate to dentate-fimbriate.

236. *H. umbellatum*. 237. *H. ogweni*. 238. *H. bichlorophyllum*.

Sect. XIII. **Sabauda**. (See page 297.)

Leaves numerous, often densely pilose, not reticulate beneath, \pm heteromorphous, the lower attenuate below, the upper sessile with \pm rounded base; margins ciliate or scaberulous. Inflorescence paniculate-corymbose, with many medium, or more rarely large heads. Phyllaries incumbent in bud, appressed or the outer lax, dark and \pm concolorous, long-pilose and/or finely glandular, or glabrescent. Ligules glabrous-tipped. Styles usually livid. Margins of receptacle-pits fibrillous-dentate.

Series *Eu-Sabauda*.

Peduncles often long-pilose as well as floccose. Phyllaries long-pilose and finely glandular.

239. *H. Bladonii*. 240. *H. perpropinquum*. 241. *H. argutifolium*. 242. *H. eminentiforme*.

Series *Borealia*.

Peduncles usually floccose only. Phyllaries finely glandular or not, rarely with solitary pilose hairs.

243. *H. virgultorum*. 244. *H. rigens*. 245. *H. vagum*. 246. *H. sublactucaceum*. 247. *H. calvatum*. 248. *H. croceostylum*. 249. *H. subquercetorum*.

Subgenus *PILOSELLA* S. F. Gray, Nat. Arr. Brit. Pl. ii. 421 (1821); Tausch, *Bermerkungen über Hieracium* in Flora, xi. Beil. i. 50 (1828); Fries, l. c. 5 and 9

(1862); Williams, l. c. 77 (1902); W. R. Linton, Brit. Hier. 1 (1905); Rouy, l. c. ix. 234 (1905); Zahn, l. c. 1147 (1923); *Piloselloidea* Naegeli and Peter, Hier. Mittel-Europas, i. 114 (1885).

Rhizome horizontal or oblique, with phyllopodous rosettes of leaves, from the axils of which prostrate, leafy or underground, scaly stolons are often developed, which form apical rosettes. Leaves entire or at most denticulate, attenuate below without a distinct petiole. Heads (expanded) 7-25(-35) mm. in diameter. Ligules yellow or red, glabrous-tipped. Achenes small, 1.5-2(-2.5) mm. long, purplish black, with the apex crenulate owing to the ribs expanding into very short, spreading projections. Pappus hairs one-seriate, with few shorter.

Distribution.—Europe, North-west Africa, Asia Minor to Northern Asia.

Conspectus of Species.

A. ACAULIA, NP. l. c. i. 114 (1885); Zahn, l. c. 1147 (1923).

Stoloniferous plants with basal rosettes from which a one-headed, leafless scape arises, sometimes also lateral or secondary scapes from the axils of the rosette-leaves.

Sect. XIV. *Pilosellina*. (See page 312.)

Leaves lanceolate to obovate, entire or subdenticulate, green or glaucescent and ±long-setose above, paler and tomentose (also ±pilose) beneath. Flower-heads rather small to rather large. Ligules light yellow, the outer usually marked with red beneath.

250. *H. Peleterianum*. 251. *H. Pilosella*.

B. CAULIGERA NP. l. c. i. 115 (1885); Zahn, l. c. 1148 (1923).

Cauligerous plants, stoloniferous or not, producing from the basal rosette of leaves a stem, often leafy (or stems), which is branched and few- or many-headed.

Sect. XV. *Auriculina*. (See page 319.)

Stoloniferous plants of generally low growth, with ±erect, only slightly leafy stems. Leaves entire, ±spathulate and glaucous. Inflorescence few-headed. Heads ±small. Ligules yellow, generally concolorous.

252. *H. Lactucella*. 253. *H. helvolum*.

Sect. XVI. *Pratensina*. (See page 321.)

Stoloniferous plants of taller growth, with ±erect, pilose and slightly leafy stems. Leaves lanceolate to elliptic, green, pilose, not rigid. Inflorescence usually many-headed. Heads of medium size to small. Ligules yellow to deep red.

Series *Stoloniflora*.

Inflorescence lax, with few heads of medium size. Ligules yellow.

254. *H. flagellare*.

Series *Eu-Pratensina*.

Inflorescence compact, with many ±small heads. Ligules yellow to deep red.

255. *H. colliniforme*. 256. *H. aurantiacum*. 257. *H. brunneocroceum*.

Sect. XVII. *Praealtina*. (See page 326.)

Plants of taller growth, stoloniferous or not, with erect, firm, ±leafy stems. Leaves linear to lanceolate, rigid, glaucous. Inflorescence paniculate, many-headed. Heads small to very small. Ligules yellow, concolorous.

Series *Eu-Praealtina*.

Plant not stoloniferous.

258. *H. praealtum*.

Series *Bauhinia*.

Plants stoloniferous.

259. *H. arvorum*. 260. *H. Spraguei*.

EU-HIERACIUM Torrey and Gray. (See page 25.)

A. PHYLLOPODA Godet. (See page 26.)

Sect. I. **AMPLEXICAULIA**.

E. Fries, *Epicrisis Generis Hieraciorum*, 48 (1862); *K. H. Zahn*, *Compositae-Hieracium*, in *Pflanzenreich*, iv. 280, 722 (1921).

Cauligerous plants with stem, foliage and inflorescence clothed with viscid glandular hairs, some species also with less numerous simple pilose hairs, chiefly on the basal rosette of leaves. Rootstock sometimes apically long-pilose or woolly. Leaves generally yellowish green, the radical attenuate below, the cauline often semi-amplexicaul. Inflorescence racemose- or paniculate-corymbose, \pm many-headed, with leafy branches from the axils of the stem-leaves. Flower-heads large; phyllaries incumbent in bud; ligules strongly pilose-tipped or ciliate; styles yellow to livid. Margins of receptacle-pits shortly dentate, fibrillous-ciliate.

Flowering June–July.

Plants, often with showy flowers, of south-west Europe, widely naturalized in more northern countries.

* Plant with glandular hairs only, epilose (except on the rootstock and primordial leaves). Styles yellow.

Leaves yellowish green, the radical oblong, the upper cauline ovate, cordate. . . *H. amplexicaule*.

** Plants with glandular and pilose hairs on the stem and foliage. Styles livid.

Leaves \pm glaucescent, the radical oblong, sharply toothed, the upper cauline linear-lanceolate *H. pulmonarioides*.

Leaves yellowish green, the radical obovate-lanceolate, sinuate-dentate, the upper cauline ovate, subcordate *H. speluncarum*.

1. **HIERACIUM AMPLEXICAULE** L. Sp. Pl. 803 (1753); Hooker in Eng. Bot. Suppl. no. 2690 (1831); Macreight, Man. Brit. Bot. 145 (1837); Fries, *Epicr.* 49 (1862); F. J. Hanbury in Bab. Man. ed. 9, 239 (1904); Zahn, l. c. 723 (1921).

Icon.—Eng. Bot. Suppl. t. 2690 (E. B. ed. 3, 835).

Exsicc.—Sudre, Hb. Hier. v. 245 (Alpes-Maritimes); Sir W. Hooker, Cleish Castle, Kinross; Miss Moseley, Oxford, 1840; Thistleton-Dyer, Oxford, 1857; Linton, no. 7; all in Hb. Mus. Brit.

Stem 20–40 (–60 cult.) cm. high, *densely clothed throughout with strong, unequal, yellowish-headed glandular hairs, epilose*, becoming \pm floccose above. *Foliage yellowish green*, the sheaths of the radical leaves \pm fringed with very long (–15 mm.); white pilose hairs, giving the rootstock the appearance of being apically villous. *Radical leaves numerous*; the primordial very small, obovate to elliptic, obtuse-mucronate to subacute, subentire, shortly narrowed below, with very long, white pilose hairs on both surfaces; the later (often large) *narrowly oblong* or obovate-oblong, obtuse-mucronate, *denticulate* to irregularly sinuate-dentate, attenuate below to \pm winged

petioles; *stem-leaves* 4-6(1-4 on the branches), gradually decreasing upwards, *sessile* and *semi-amplexicaul*, the lowest rather large, oblong, denticulate, cordate-based, the *upper ovate-cordate*, subentire, shortly acuminate; the later basal and the *stem-leaves densely clothed with short, viscid, yellow-headed glandular hairs, epilose and effloccose*. *Inflorescence paniculate-corymbose*, 8-20(-many, cult.)-headed, with ascending, leafy branches from the leaf-axils and often secondary branches, the peduncles (generally rather short) floccose, with dense, strong, yellowish-headed glandular hairs. *Heads large*, ovate-based. *Phyllaries* incumbent in bud, olive green, linear-lanceolate (the outermost sometimes lax and broader), acute, floccose and strongly senescent, *with dense, strong, unequal, yellowish glandular hairs, epilose*. *Ligules densely pilose-tipped*. *Styles yellow*. Margins of receptacle-pits shortly dentate, fibrillous-ciliate. Achenes reddish black, 3-3.5 mm. long, with nearly pure white pappus.

This species, a native of south-western Europe and the southern Alps, has been naturalized in Britain, generally on old walls, for more than a century. It still grows at Oxford. The plant is represented in the Linnaean Herbarium and the Hortus Cliffortianus.

Distribution.—23. Oxford: (Hooker)! 65. N.W. Yorks: Upper Yoredale (Whaley). 87. Kinross: Cleish Castle (Hooker).

General Distribution.—Morocco, Spain, France, Italy, Switzerland! Naturalized in Germany and Holland.

2. *HIERACIUM PULMONARIOIDES* Villars, Prosp. 36 (1779); Hist. Pl. Dauph. iii. 133 (1789); Fries, Epicr. 49 (1862); Pugsley in Journ. Bot. lviii. 281 (1920); *H. amplexicaule* subsp. *pulmonarioides* Zahn, l. c. 726 (1921).

Exsicc.—Schultz, Hb. Norm. 707; Schultz-Bip. Cichor. ii. 134; Melvill, Stretford, 1898; all in Hb. Mus. Brit.; Pugsley no. 562, in Hb. Pugsley.

Stem 20-50 cm. high, clothed with strong, deflexed pilose hairs and dense, brownish glandular hairs towards the base, the pilose hairs disappearing upwards and the glandular becoming blackish, the upper part of the stem also \pm floccose. *Foliage pale green, often glaucescent*; the primordial radical leaves, if produced, oval, obtuse-mucronate, sinuate-dentate, narrowed to short, winged petioles; the later, normally large and often numerous, narrowly oblong or lanceolate to oblanceolate, \pm acute, with irregular, sharp and sometimes cusped or coarse teeth increasing towards the long-attenuate base; *stem-leaves* 3-5, the lowest lanceolate-deltoid, acuminate, sessile, with sharp, spreading teeth towards the subtruncate or rounded base, the upper smaller, becoming less toothed, and the uppermost (as also those of the branches) linear-lanceolate, entire, \pm bractlike but dilated below; all with numerous, brownish glandular and long, pale pilose hairs on both surfaces and the margins, the long or shorter winged petioles clothed with long, spreading or deflexed pilose hairs. *Inflorescence racemose-corymbose*, 3-10(-15)-headed, with arcuate, suberect lower branches, the peduncles rather long, floccose, with dense, strong, unequal, blackish glandular hairs. *Heads large to very large*, ovate-based. *Phyllaries* incumbent in bud, olive-green, long and narrow (the outer rather lax), linear-lanceolate, attenuate, acute, \pm floccose, strongly senescent, *with dense, strong, unequal, blackish glandular hairs, epilose*. *Ligules densely pilose-tipped*. *Styles livid*. Margins of receptacle-pits shortly dentate, fibrillous-ciliate. Achenes blackish, 3.5-4 mm. long.

This plant was first recorded as British in the 'Journal of Botany' for 1920 (l. c.) from specimens collected in 1907 at Kenmore, in Perthshire, where it was presumably introduced. It seems to grow with or near *H. amplexicaule* in the neighbourhood of Hawes, in Yorkshire, and was confused with this species by Melvill (Journ. Bot. lix, 48, 1921).

Distribution.—59. S. Lanes : Stretford (Melvill). 62. N.E. Yorks : Saltburn (Bailey). 65. N.W. Yorks : Gayle (F. A. Lees). Upper Yoredale (Crossfield). 88. Mid Perth : Kenmore !

General Distribution.—Alps of Central Europe ! Naturalized in Germany and at Upsala.

3. *HIERACIUM SPELUNCARUM* Arvet-Touvet, Spicil. 28 (1881), pro parte ; Hier. Alp.-Fr. 50 (1888) ; *H. amplexicaule* subsp. *speluncarum* Zahn, l. c. 726 (1921).

Icon.—Pl. 1, fig. a.

Exsicc.—Sudre, Hb. Hier. vii. 346 (Pyr.-Or.) and 347 (Arveyron) ; Faure, Monetier-les-Bains, 1910 ; Roffey, Rothiemurchus, 1914, as *H. amplexicaule* ; all in Hb. Mus. Brit. ; Pugsley no. 563, in Hb. Pugsley.

Stem 30–60 cm. high, robust, striate, *pilose below* with long, whitish hairs, which disappear *upwards* and give place to \pm *dense, yellowish glandular hairs*. Foliage undulate, *yellowish green* ; the *radical leaves* large, numerous, *obovate-lanceolate*, obtuse-mucronate to subacute, *sinnuate-dentate* or with sharp, spreading teeth towards the cuneate base ; *stem-leaves* 3–6, larger than in *H. amplexicaule* or *H. pulmonarioides*, the lowest *oblanceolate*, acute, toothed, narrowed below to a very broadly winged petiole, or sessile and subcordate, the *upper* (gradually decreasing in size) *ovate-acuminate, sessile, subcordate*, becoming subentire ; branches of the panicle often with 3–4 smaller, similar leaves ; all with \pm *numerous pilose and viscid, yellowish glandular hairs* on both surfaces, the margins densely ciliate with a mixture of pilose and glandular hairs, and the petioles \pm long-pilose. *Inflorescence paniculate-corymbose*, 6–20(–40, cult.)-headed, generally with long, leafy, suberect lower branches, the peduncles floccose and densely clad with strong, brownish glandular hairs. *Heads large*, rounded below. *Phyllaries* incumbent in bud, olive-green, linear-lanceolate, acute, slightly floccose, senescent, *with dense, strong, unequal, brownish glandular hairs, epilose*. *Ligules densely pilose-tipped*. *Styles livid*. Margins of receptacle-pits shortly dentate, fibrillous-ciliate. Achenes blackish, 3.5–4 mm. long.

Like *H. pulmonarioides*, this species differs from *H. amplexicaule*, for which it was formerly mistaken in this country, by the presence of an abundance of pilose hairs intermixed with the glandular clothing of the stem and foliage. It is distinguishable from *H. pulmonarioides* by its stronger growth, yellowish green rather than glaucescent foliage, with the upper stem and branch-leaves broad and ovate-acuminate, and its less attenuate phyllaries. The plant mentioned in Journ. Bot. ix. 56 (1922), from Richmond Hill, Clifton, and that growing on the ruins at Arras, in Northern France, are both *H. speluncarum*. There is a specimen of this plant in Herb. Backhouse from the nursery of Eagle and Henderson, at Edinburgh, where it is said to have accidentally appeared, of uncertain origin. The occurrence of three species of this group as naturalized plants in widely scattered localities in Great Britain does not admit of a ready explanation.

Distribution.—6. N. Somerset : Mells (Druce). 34. W. Glo'ster) : Clifton ! 88. Mid Perth : Barnhill, Perth (A. Brown). 96. E. Inverness : Rothiemurchus (Roffey).

General Distribution.—Pyrenees, Southern France, Switzerland. Naturalized in Northern France ! Holland and Germany.

Sect. II. ALPINA.

Fries, Epier. 42 (1862), excl. *Hypophyllopoda* ; Rouy, Fl. France, ix. 262 (1905). *Alpina Genuina* (and *Nigrescentia* partim) W. R. Linton, Brit. Hier. 2 (1905) ; *Alpina* (and *Alpina-Vulgata* partim) Zahn, l. c. 621 and 636 (1921).

Scapigerous plants of \pm dwarf habit, with green or rarely caesious foliage. Leaves (the radical \pm numerous except in *H. pseudo-petiolatum* and *H. Backhousei*) clothed with pilose (often stiff) hairs, among which are scattered less numerous very fine, yellowish, glandular hairs (best seen in *exsiccatæ* on the margins of the innermost leaves); very rarely the leaves are floccose and scarcely pilose. Stem usually long-pilose, leafless or with few and small, non-amplexicaul leaves. Heads of medium size to large, generally solitary (rarely 2-5), with densely long-pilose, effloccose and usually sparingly glandular phyllaries, which are incumbent in bud; ligules pilose on the back and the tips or at least \pm pilose-tipped. Styles yellow to livid. Margins of receptacle-pits normally shortly dentate.

Flowering July-August.

The plants of this Section, which inhabit arctic and subarctic Europe and Asia, as well as the Alps of Central Europe, are almost confined in this country to the mountains of Scotland, where they grow at relatively great heights on rock-ledges and bare stony slopes. Two species alone extend into the English Lake district, and one to North Wales, while in Ireland they are entirely unknown. They appear to be diminishing plants and are much scarcer than formerly in most of the well-known Scottish stations. No recent specimens have been seen comparable with the fine series obtained by Hanbury and others in the eighties. In Cumberland and North Wales *H. holosericeum* fails to flower in many seasons and appears to be dying out, and its condition on some Scottish hills is not much better.

The *Alpina*, which are beautiful plants of dwarf habit with relatively large and showy heads of flowers, closely resemble the species of the Section *Barbata* occurring in the Central European Alps, but are distinguished by the presence of glandular hairs on the foliage and of pilose hairs on the tips of the ligules.

In my experience the *Alpina* are not easy to cultivate and are much beloved of slugs, but there are many luxuriant specimens in Herb. Hanbury which were grown in his garden at Clapton.

Series *Genuina* [Grex *H. alpinum* L.].

Leaves narrow (less so in *H. calenduliflorum*), attenuate below. Ligules pilose on the back as well as the tips.

* Leaves gradually attenuate to long petioles.

! Heads always solitary.

Radical leaves deep green, obovate-lanceolate or \pm spathulate, little toothed, pilose. Heads of medium size, densely pilose with long, whitish hairs. Styles yellow

H. alpinum.

Radical leaves light green, narrowly linear-oblong, subentire, very pilose. Heads rarely large, densely pilose with very long, whitish, silky hairs. Styles yellow

H. holosericeum.

!! Heads solitary, or rarely 2-3.

Radical leaves dull green, oblong, sinuate-denticulate, floccose. Heads rather large, densely pilose with long, whitish hairs. Styles yellow

H. Grovesii.

Radical leaves yellowish green, lanceolate, dentate to subentire, very pilose. Heads large, densely pilose with long, whitish hairs. Styles livid or yellow

H. ezimium.

Radical leaves caesious green, obovate-lanceolate, \pm dentate, pilose. Heads very large, densely pilose with long, dusky hairs. Styles dark livid

H. calenduliflorum.

** Leaves narrowed to short petioles.

Radical leaves yellowish green, oblong, sinuate-dentate, very pilose. Heads (often 2) of medium size, densely pilose with very long, whitish hairs. Styles yellow. Achenes very long

H. macrocarpum.

Radical leaves light green, oblong, sinuate-dentate, slightly pilose. Heads (usually solitary) large, densely pilose with long, dusky hairs. Styles yellow

H. graniticolum.

Series *Nigrescentia* [Grex *H. nigrescens* Willd.].

Leaves often broader, sharply or irregularly toothed, less attenuate below (except in *H. gracilentum*, *H. pseudo-petiolum* and *H. Backhousei*). Heads blacker, less pilose, generally solitary but sometimes 2-5 (except in *H. pseudo-petiolum*). Ligules pilose-tipped only (except in *H. subgracilentipes*).

* Leaves generally narrow, very rarely coarsely and irregularly toothed.

- Radical leaves bright green, lanceolate, denticulate, attenuate below, stiffly pilose. Heads of medium size, densely pilose with long, dusky hairs. Styles yellowish *H. gracilentum*.
 Radical leaves caesious, small, oval, denticulate, shortly attenuate below, ± pilose. Heads large, rounded, densely pilose with long, dusky hairs. Styles normally yellow *H. globosiflorum*.
 Radical leaves green, lanceolate, with shallow teeth, attenuate below, stiffly pilose. Heads solitary, rather large, densely pilose with long, whitish hairs. Styles livid *H. pseudo-petiolum*.
 Radical leaves deep green, lanceolate, sharply toothed, attenuate below, long-pilose. Heads often 2-3, large, densely pilose with whitish hairs. Styles fuscous *H. Backhousei*.

** Leaves broader, often coarsely and irregularly toothed.

- Radical leaves light green, elliptic-ovate, irregularly serrate-dentate, ± shortly contracted below, softly pilose. Heads large, densely pilose with dusky hairs. Styles fuscous *H. pseudo-curvatum*.
 Radical leaves caesious, oval, broadly toothed, shortly contracted below, ± pilose. Heads 1-5, large, densely pilose with dusky hairs, fairly glandular. Styles fuscous *H. nigrescens*.
 Radical leaves bright green, oval, irregularly incise-dentate, ± attenuate below, shortly pilose. Heads 1-4, normally large, densely pilose and glandular with dusky hairs. Styles normally yellow *H. Hanburgi*.
 Radical leaves pale green, elliptic-lanceolate, serrate-dentate, attenuate below, shortly pilose. Heads large, densely pilose with long, dusky hairs. Ligules pilose on backs as well as tips. Styles livid *H. subgracilentipes*.

Series **Genuina**. (See page 38.).

4. *HIERACIUM ALPINUM* L. Sp. Pl. 800 (1753), excl. syn. partim; J. Backhouse, Mon. Brit. Hier. 17 (1856); Fries, Epier. 42 (1862); Hanb. III. Mon. Brit. Hier. 12 (1889), and in Bab. Man. ed. 9, 233 (1904); W. R. Linton, Brit. Hier. 13 (1905); *H. alpinum* subsp. *alpinum* Zahn, l. c. 623 (1921); *H. melanocephalum* Syme, Eng. Bot. ed. 3, v. 170 (1866); *H. alpinum* β *melanocephalum* F. N. Williams, Prodr. Fl. Brit. iii. 97 (1902); non *H. melanocephalum* Tausch.

Icones.—Eng. Bot. ed. 3, t. 827, as *H. melanocephalum*; Hanb. III. Mon. pl. 5.

Essicc.—Fries, Hb. Norm. 10, no. 7; Bourgeau, Alpes de Savoie, no. 167; Dahlst. H. Exs. iii. 15; Lindbg. H. Sc. ii. 51; Backhouse, Braeriach, 1855; Linton, no. 51 (Corrie Etchachan and Ben Socaich); Linton, Ben-a-Bourd, 1897; all in Hb. Mus. Brit.

Stem 7-12(-25) cm. high, rather slender, unbranched, floccose, with ± dense, very long, spreading, black-based pilose hairs, with some fine, short, dark glandular hairs intermixed, chiefly towards the flower-head. *Radical leaves* ± numerous, deep green, undulate and sometimes recurved; the primordial small, obovate-spathulate, rounded-obtuse-mucronulate, subtruncate or even retuse, entire, shortly narrowed below; the later *obovate-lanceolate* (or the innermost sometimes narrowly oblanceolate), rounded-obtuse to subacute, *subentire or with a few obscure teeth* or denticulations, *attenuate* below to usually long and slender petioles; stem-leaves 1-2, the lower (often placed low on the stem) long, linear-lanceolate, subacute, entire, attenuate below but sessile, the upper, if present, similar but smaller, and often high on the stem; all with scattered or dense stiff, long pilose hairs on both surfaces, margins and petioles (the stem-leaves densely hirsute), with ± numerous short, fine, yellow-headed glandular hairs interspersed among the pilose hairs of the lamina. *Head* solitary, usually of medium size but occasionally large, rounded below. *Phyllaries* incumbent

in bud, not numerous, blackish green, the outer lax, broad, linear-lanceolate, shortly acute, the inner lanceolate-subulate, acute, with the innermost narrow and finely acuminate, *densely clothed with very long, whitish, black-based pilose hairs*, among which a few fine, dark glandular hairs are concealed. *Ligules* light yellow, *with many pilose hairs on the back and about the tip*. *Styles* yellow. Margins of receptacle-pits shortly dentate. Achenes reddish black, 3·5–4 mm. long.

β. insigne Bab. Man. ed. 4, 198 (1856); Hanb. Ill. Mon. 14 (1889); W. R. Lint. Brit. Hier. 14 (1905); *H. alpinum* var. *melanocephalum* f. *grande* Williams, l.c. 97 (1902); *H. alpinum* subsp. *nigrosetosum* Zahn, l.c. 626 (1921).

Exsicc.—Hanbury, Glen Derry, in Hb. Hanbury; Linton, Corrie Etchachan 1897, in Hb. Mus. Brit.

Stem –25 cm. high, rather robust, with long and short, dark glandular as well as pilose hairs. Radical leaves often with remote, coarse, occasionally cusped teeth. Heads broad and very large.

H. alpinum, as here described, agrees with the accounts of Backhouse, Hanbury and W. R. Linton, and with the exsiccata in the Linnaean Herbarium, which, according to Jackson, was present there before 1753 and must be regarded as the specific type. Linnaeus (l.c.) states that it grows “in albis Lapponicis, Britannicis.” Ray’s plant, cited by Linnaeus in synonymy, is *H. holosericeum* Backh.

The variety *insigne* approaches *H. Halleri* Vill. and *H. eximium* Backh. in its foliage.

In this, as in other species of the Section, the glandular hairs of the foliage are often less well marked in British than in Continental *exsiccatae*.

Distribution.—92. S. Aberdeen: Cairntoul (Hanbury). Ben-a-Bourd (Linton). 94. Banff: Corrie Etchachan (Linton). 96. E. Inverness: Braeriach (Backhouse). Glen Eunach (Groves). Cairngorm (Druce). 97. W. Inverness: Sron-an-lochan! Aonach Mor and Ben Socaich (Marshall).

var. *insigne*.

92. S. Aberdeen: Glen Derry (Hanbury). 94. Banff: Corrie Etchachan (Linton).

General Distribution.—Scandinavia, Lapland, Iceland, Greenland, Alps of Central Europe! Riesengebirge, Sudeten, Tatra.

5. *HIERACIUM HOLOSERICEUM* Backhouse, Mon. 19 (1856); Fries, Epier. 43 (1862); Hanb. Ill. Mon. 15 (1889), and in Bab. Man. ed. 9, 233 (1904); W. R. Lint. Brit. Hier. 14 (1905); *H. alpinum* Smith, Eng. Bot. no. 1110 (1802); *H. alpinum* α *alpinum* Williams, l.c. 97 (1902); *H. alpinum* subsp. *alpinum* var. *genuinum* subvar. *villosissimum* f. *holosericeum*, Zahn, l.c. 624 (1921).

Icones.—Eng. Bot. t. 1110, as *H. alpinum* (E. B. ed. 3, 826); Hanb. Ill. Mon. pl. 6 (leaves abnormal); Pl. 1, fig. b.

Exsicc.—Schultz-Bip. Cichor. no. 2 (Riesengebirge); Petrak, Fl. Boh. and Mor. iii. 281 (Riesengebirge); Backhouse, Lochnagar, 1855; Linton, no. 28 (Corrie Ardran and Fersit Forest); all in Hb. Mus. Brit.

Stem 5–15(–25) cm. high, ±slender, pilose throughout with very long (–10 mm.), spreading, whitish, dark-based pilose hairs, also floccose and with scattered, fine, dark glandular hairs above. *Radical leaves* normally ±numerous, *light green*; the primordial small, obovate-oblong, rounded-obtuse to retuse, entire or rarely remotely subdenticulate, narrowed below to broadly winged petioles; the later ±narrowly linear-oblong, rounded-obtuse to subacute, *entire*, gradually *attenuate below to ±long petioles*; stem-leaves 0–2(–3), narrowly linear-oblong, subacute, entire, sessile; all

clothed on both surfaces, margins and petioles (especially the cauline and the upper side of the inner basal) *with long, stiff, silky pilose hairs*; small, yellow-headed glandular hairs also \pm numerous on the lamina. *Heads solitary, usually small in dwarf plants but often of medium size or occasionally large, rounded below or \pm narrower when small. Phyllaries incumbent in bud, few, blackish green, the outer lax, broad, linear-oblong, obtuse (rarely subfoliaceous), the inner narrow, nearly linear, \pm acute, senescent, normally most densely clothed with very long, silky, whitish, dark-based pilose hairs. Ligules with many pilose hairs on the back and about the tip. Styles yellow.* Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3.5 mm. long.

H. holosericeum is readily separable from *H. alpinum* by its narrow, obtuse, subentire foliage, and by its remarkably silky-pilose heads with narrow inner phyllaries. It is a very variable species, most frequently occurring as a dwarf, small-headed plant in bare, exposed situations, where it often flowers but sparingly. In other situations it may become a very much larger plant whose silky heads are very attractive. It is clearly depicted in the third edition of Ray's *Synopsis*, tab. 6, f. 2 (1724), as a Welsh plant, *H. villosum alpinum flore magno singulari, caule nudo*.

Distribution.—49. Carnarvon: Llyn-y-Cwm! Tryfan (Lloyd Williams). 69. Westmorland: Langdale Pikes! 70. Cumberland: Glaramara (Backhouse). 73. Kirkcudbright: Milldown (McAndrew). 88. Mid Perth: Ben Chaluim (Marshall). Ben Laoigh (Ewing). Ben More and Corrie Ardran (Linton). Ben Dubh Craige (Groves). Ben Lawers (Greville). 89. E. Perth: Glen Beg (Foggitt). Cairnwell (Marshall). 90. Forfar: Canlochen! Glen Caness (Marshall). Glen Isla (Hanbury). 92. S. Aberdeen: Lochnagar (Backhouse). Glen Callater! 94. Banff: Ben Avon (Marshall). 96. E. Inverness: Cairngorm (Marshall). 97. W. Inverness: Ben Aulder (Watson). Fersit Forest (Linton). Ben Chlinaig! Ben Socaich (Marshall). Moidart (Macvicar). 98. Argyll: Kingshouse (Hanbury). Glen Etive (Marshall). 105. W. Ross: Glen Carron (Sewell). 108. W. Sutherland: Ben Hope (Hanbury). Inchnadamph (Foggitt).

General Distribution.—Scandinavia (Hanbury), Vosges (Hanbury), Germany (Harz, Brocken and Riesengebirge), Sudeten, Switzerland (Val Piora, Ticino!).

6. *HIERACIUM GROVESII* Pugsley in Journ. Bot. lxxix. 177 (1941).

Exsicc.—Pugsley nos. 570 (type), 571 and 572; all in Hb. Pugsley.

Caulis 12–20(–25) cm., gracilis, inferne pilis pallidis sparsis paululum superne pilis multis basi atris patulis glandulisque nonnullis tenuibus obscuris densius floccosus. *Folia radicalia* numerosa, *obscura viridia*, plurima satis parva, obovato-oblonga vel *oblonga* ad lanceolata, obtuso-mucronulata ad acuta, exteriora *sinnuato-denticulata* (rarius paucis dentibus imparibus patentibus), intima saepe subintegra, *in petiolum saepe longum attenuata*; caulinum 0 vel 1, lineare, bracteaeforme; omnia superne glabrescentia vel vix floccosa, in parte aversâ dense *floccosa*, paucis glandulis minutis subluteis immixtis, marginibus ciliatis petiolisque floccosis pilosis. *Capitulum* (rarissime 2) involucri inferne vix rotundato *majusculum*. *Squamae* obscure olivaceae, satis numerosae (exterioribus appressis), lineari-lanceolatae, acutae vel intimae tenuiter acuminatae, paulo senescentes, *pilis densis longis basi atris glandulisque paucis tenuissimis immixtis obtectae*. *Ligulae apice et in parte aversâ valde pilosae*. *Styli lutei*. Alveoli receptaculi margine breviter dentati.

Stem 12–20(–25) cm. high, slender, sparingly floccose with scattered pale pilose hairs below, more densely floccose with numerous spreading, dark-based pilose and some fine, dark glandular hairs above. *Radical leaves* numerous, *dull green*, rarely large; the primordial small, oval to oblong, rounded-obtuse, subentire, shortly

contracted below; the later obovate-oblong or *oblong* to lanceolate, obtuse-mucronulate to acute, the outer *sinuate-denticulate* or, especially in strong plants, with a few, unequal, spreading teeth, the innermost sinuate-denticulate or often subentire, *attenuate below to (frequently long) petioles*; stem-leaf 0 or 1, linear and bractlike, sometimes placed low on the stem; all glabrescent or slightly *floccose above and densely floccose beneath*, with a few fine, yellowish glandular hairs intermixed, the margins ciliate and the petioles floccose and pilose. *Heads solitary (very rarely 2), rather large*, scarcely rounded below. *Phyllaries* incumbent in bud, dark olive-green, rather numerous with the outer appressed, linear-lanceolate, acute or the inner finely acuminate, slightly senescent, *with dense long, whitish, dark-based pilose hairs*, among which a few very fine glandular hairs are intermixed. *Ligules strongly pilose-tipped and with numerous pilose hairs on the back*. *Styles yellow*. Margins of receptacle-pits shortly dentate. Achenes blackish, about 4.5 mm. long.

This new species has been described from 25 specimens collected about the Larig Pass, near Braemar, by Henry Groves in the years 1889 and 1890, and left unnamed. It differs widely from all the other British species of the group by its floccose and almost epilose foliage. Among Continental species enumerated in Zahn's Monograph it seems most to resemble *H. adpersum* Norrl. (Bidr. 1. 76 (1888)), but in this the stem-leaves only are floccose. The stem-leaves of *H. adpersum*, moreover, are usually three in number, and its habit rather recalls *H. gracilentum* Backh. Its heads, too, are very much smaller than in the new species. No later specimens of *H. Grovesii* have been seen in herbaria.

Distribution.—96. E. Inverness: Larig Pass (Groves).

Endemic.

7. *HIERACIUM EXIMIUM* Backhouse, Mon. 20 (1856); Fries, Epier. 43 (1862); Hanb. Ill. Mon. 18 (1890), and in Bab. Man. ed. 9, 233 (1904); W. R. Lint. Brit. Hier. 14 (1905); *H. villosum* Smith, Eng. Bot. 2379 (1812)? non L.; *H. Halleri* Williams, l. c. 98 (1902), non Vill.; *H. nigrescens* subsp. *eximium* Zahn, l. c. 658 (1921).

Icones.—Eng. Bot. t. 2379, as *H. villosum*?; Eng. Bot. ed. 3, t. 825; Hanb. Ill. Mon. pl. 7; Zahn, l. c. fig. 49 B, 1-7.

Exsicc.—Backhouse, Glen Fiagh and Glen Isla, 1855; Fries, Eur. Hier. no. 1 b, Dovre; Lindeberg, H. Sc. ii. 53 (Dovre); Linton no. 1 (Clova); Linton, Glen Callater, 1884; all in Hb. Mus. Brit.

Stem 10-30(-35) cm. high, flexuous, \pm densely pilose with unequal (partly very long) dark-based hairs, also floccose, chiefly above, with usually some short, dark glandular hairs. *Radical leaves yellowish green*, often numerous; the primordial small, oval, obtuse-mucronate, subentire or with a few spreading teeth, cuneate-based; the later sometimes very long (~20 cm.), *oblong to linear-lanceolate*, mostly acute, distantly *dentate* with unequal, partly very long, spreading teeth *to subentire, gradually attenuate below to long, \pm winged petioles*; stem-leaves 0-3, the lowest linear-lanceolate, acute, rarely toothed, sessile, the upper smaller, linear, becoming bractlike; all \pm densely clothed on both surfaces, margins and petioles with long, stiff pilose hairs, with some fine, yellowish glandular hairs intermixed on the lamina. *Head solitary (rarely 2-3), large or very large, rounded below*; buds nodding. *Phyllaries* incumbent in bud, dark olive green, numerous in strong plants, narrow with the outer lax, linear-lanceolate, attenuate, acute, senescent, *with dense, long, silky, whitish, dark-based pilose hairs*, and sometimes a very few short, dark glandular hairs intermixed. *Ligules strongly pilose on back and tips*. *Styles livid*. Margins of receptacle-pits shortly dentate. Achenes blackish, 3.5-4 mm. long.

β. tenellum Backh. l. c. 21 ; Hanb. l. c. 20 ; Bab. Man. l. c. ; W. R. Lint. l. c. *H. alpinum* subsp. *alpinum* var. *pumilum* sub-var. *tenellum*, Zahn, l. c. 624.

Icon.—Hanb. Ill. Mon. pl. 8.

Exsicc.—Backhouse, Little Craigindal, 1855 ; Linton no. 52 (Glen Callater) ; Groves, Larig Pass, 1886 ; all in Hb. Mus. Brit.

Stem, on an average, lower and with shorter, more entire foliage than in the type, but sometimes equally tall with very long leaves (–20 cm.), which are similarly toothed. *Styles yellow.*

H. eximium is a handsome hawkweed, allied to *H. alpinum* and to *H. Halleri* Vill., and very variable in its leaf-cutting. There is little but the colour of the styles to separate the variety *tenellum* from the typical species, and it is difficult to understand Zahn's transfer of the variety to *H. alpinum* L., sensu stricto, while the type is made a subspecies of *H. nigrescens* Willd. *H. eximium* seems to have been first discovered on Lochnagar by George Don. There is a specimen in Herb. Smith, labelled *H. villosum* L. (T. MacKay, Ben Lawers, 1800), which is *H. eximium*, and another, similarly named (T. Drummond, Loch Callater, 1825), which is *H. villosum* L. It is doubtful whether the latter is a wild example. Another specimen of *H. villosum* exists in Herb. Mus. Brit., labelled '*H. villosum* Sm. Clova, 8/42, W. Gardiner'. This also is of doubtful origin. *H. villosum* L. was reputed to be a British plant as long ago as the time of Ray, and Petiver (Catalogue of Mr. Ray's English Herball (1713), pl. xiii. f. 6) gives an unmistakable figure of it, stating that it grows on rocks in North Wales. It is rejected as a British plant by Dillenius (Synopsis, ed. 3, 169 (1724), who points out that *H. holosericeum* was mistaken for it. Smith (l. c.) confused it with *H. eximium*, and Syme (E.B. ed. 3, v. 182 (1866)) redescribed it as a doubtful Scottish plant distinct from *H. eximium*, figuring it afresh and not too happily from a cultivated specimen (Pl. DCCCXXXIX). No certainly wild British examples are known to exist and it is unlikely from its Continental distribution ever to have occurred here.

Curtis (Fl. Londinensis, v. 208, t. 215 (1826)) depicts *H. Halleri* Vill. as a British plant, but without any reference to its origin. The plant of the plate recalls *H. anglicum* var. *amplexicaule*, but its phyllaries are not villous, its ligules glabrous-tipped and its styles yellow !

Distribution.—88. Mid Perth : Ben More (Marshall). Meal Garbh ! Ben Heagsarnich (Groves). 89. E. Perth : Cairnwell (Marshall). 90. Forfar : Glen Fiagh (Backhouse). Clova ! Canlochen (Ewing). 92. S. Aberdeen : Lochnagar (Ewing). Glen Callater ! 96. E. Inverness : Glen Eunach (Groves). 97. W. Inverness : Laggan (Marshall). 98. Argyll : Clach Leathad (Hanbury). Kingshouse and Ben Creachan (Marshall).

var. *tenellum*.

88. Mid Perth : Glen Lyon (Linton). Ben Chonzie (Melvill). 92. S. Aberdeen : Little Craigindal ! Ben Macdui (Linton). Cairntoul (Hanbury). Glen Callater ! 94. Banff : Cairngorm (Marshall). 96. E. Inverness : Glen Eunach and Larig Pass (Groves). 98. Argyll : Glen Etive (Marshall). Kingshouse (Hanbury). 108. W. Sutherland : Ben Klibreck (Marshall).

General Distribution.—Norway (Dovre). Germany (Harz, Brocken (Heinmann)).

8. *HIERACIUM CALENDULIFLORUM* Backhouse, Mon. 23 (1856) ; Fries, Epier. 43 (1862) ; Hanb. Ill. Mon. 23 (1890), and in Bab. Man. ed. 9, 234 (1904) ; W. R. Lint. Brit. Hier. 14 (1905) ; *H. Halleri β. calenduliflorum* Williams, l. c. 99 (1902) ; *H. nigrescens* subsp. *calenduliflorum* Zahn, l. c. 658 (1921).

Icones.—Eng. Bot. ed. 3, t. 824 ; Hanb. Ill. Mon. pl. 9 ; Zahn, l. c. fig. 51 B, 1–7.

Exsicc.—Backhouse, Lochnagar, 1855; Linton no. 29 (Ben Socaich, Coire-an-Easain-Mor, Aonach Beg); Linton no. 79 (Aonach Beg, as *H. curvatum*); Hanbury, Kingshouse, 1889; Marshall no. 4283; Groves, Glen Eunach, 1886; all in Hb. Mus. Brit.

Stem 10–40 cm. high, \pm densely clothed with long (sometimes very long), spreading, black-based pilose hairs, with an admixture of fine, dark glandular hairs in the upper part. *Radical leaves* often numerous, dull or caesious green; the primordial subrotund-obovate or -oval, rounded-obtuse to slightly retuse, remotely denticulate, shortly cuneate-based; the *later* (often large) variable in shape, obovate or obovate- to elliptic-lanceolate or lanceolate, rounded-obtuse to acute, denticulate to \pm sinuate-dentate, or with sharp, irregular, cusped or spreading teeth, *attenuate below to long and often winged petioles*; stem-leaves (0–)1–2(–3), small, lanceolate to linear-lanceolate, acute, the lowest rarely toothed, sessile; all with \pm dense, long, stiff pilose hairs on both surfaces, with strongly ciliate margins and villous petioles; fine, yellowish glandular hairs also present on the lamina. *Heads solitary or rarely* 2–3, normally *very large* and broad, rounded below, nodding in bud. *Phyllaries* incumbent in bud, blackish green, numerous, linear-lanceolate, acute with the innermost often narrow and finely acuminate, senescent, *with dense, long, whitish or dusky, dark-based pilose hairs*, and a few fine, dark glandular hairs intermixed. *Ligules pilose on the back and densely so about the tips*. *Styles dark livid*. Margins of receptacle-pits shortly denticulate-dentate, with numerous white filaments on the teeth ap. W. R. Linton. Achenes reddish-black, about 4 mm. long.

H. calenduliflorum, when well grown, is the handsomest and most conspicuous British species of the group *Alpina*. It is most closely allied to *H. eximium*, like which it varies considerably in its leaf-cutting, but it is readily separable by its broader, blue-green foliage, and its larger, darker and less silky heads. It has sometimes been confused with *H. pseudo-curvatum* (Zahn). It was originally discovered on Lochnagar with *H. eximium* by George Don.

Distribution.—88. Mid Perth: Ben Heasgarnich and Ben Dubh Craige (Groves). 90. Forfar: Glen Esk (Ley). 92. S. Aberdeen: Lochnagar (Backhouse). 96. E. Inverness: Glen Eunach (Groves). 97. W. Inverness: Ben Nevis (Riddelsdell). Ben Chlinaig! Ben Socaich, Coire-an-Easain-Mor, Aonach Beg, etc. (Marshall). 98. Argyll: Kingshouse (Hanbury). Glen Etive (Marshall).

General Distribution.—Norway and Sudeten, ap. Hanbury.

9. HIERACIUM MACROCARPUM Pugsley in Journ. Bot. lxxix. 177 (1941).

Exsicc.—Pugsley no. 573 (type), in Hb. Pugsley.

Caulis 10–20(–30) cm., gracilis, pilis longis patulis basi atris dense vestitus, praesertim apicem versus glandulis tenuibus obscuris sparsis floccosus. *Folia radicalia luteo-viridia*, numerosa, *patentia*, haud magna, plurima *oblonga* ad elliptico-lanceolata vel lanceolata, obtuso-mucronulata ad acuta, denticulata ad *sinuato-serrata* vel dentata (interdum dentibus longis imparibus subpatentibus), *in petiolum brevem attenuata*; caulina 1–2, parva, linearia, integra, sessilia, inferne floccosa; omnia *pilis longis rigidis dense vestita* (mollius in parte aversâ) glandulis minutis subluteis immixtis, marginibus longe ciliatis petiolisque villosis. *Capitula unica vel 2 (raro 3)*, pedunculis longis suberectis suffulta, involucri inferne vix rotundato *mediocria*. *Squamae* triste olivaceae, exteriores appressae, lanceolato-subulatae, acutissimae (intimae apice setaceae), *pilis longis pallidis densissime oblectae*, eglandulosae. *Ligulae* apice et in parte aversâ valde pilosae. *Styli lutei*. Alveoli receptaculi margine breviter dentati. *Achaenia* subatra, *maxima*, 4.5–5 mm. longa.

Stem 10–20(–30) cm. high, slender, densely pilose with long, spreading, dark-based hairs, also floccose and increasingly so upwards with some scattered, fine, dark

glandular hairs. *Radical leaves yellowish-green*, numerous, rather small, in a \pm spreading rosette; the primordial spatulate to oblong-obovate, rounded-obtuse, subentire, cuneate-based; the later *oblong* to elliptic-lanceolate or lanceolate, obtuse-mucronulate to acute, denticulate to *sinuate-serrate* or dentate, occasionally with coarse or long, irregular, ascending or spreading teeth, *attenuate below to short petioles*; stem-leaves 1-2, small, linear, entire, sessile; all *densely pilose above with long, stiff hairs* and more softly so beneath, with long-ciliate margins and villous petioles; some fine, yellowish glandular hairs present on the lamina and the stem-leaves \pm floccose beneath. *Heads solitary or 2 (rarely 3)* on long, suberect peduncles, *of medium size*, scarcely rounded below. *Phyllaries incumbent in bud*, dull olive green, lanceolate-subulate with the outer appressed, very acute (the innermost setaceous-pointed), *with very dense, long, whitish pilose hairs*, eglandular. *Ligules strongly pilose on the back and tips*. *Styles yellow*. Margins of receptacle-pits shortly dentate. *Achenes blackish, very large*, 4.5-5 mm. long.

This species is described from thirty-three specimens collected in 1890 by Henry Groves in Glen Eunach, East Inverness-shire. They had remained unnamed in his herbarium with those of *H. Grovesii*. The plant is notable for its neat rosettes of leaves recalling in form those of *H. graniticolum* but as hirsute as those of *H. eximium*, for its relatively small and narrow, shaggy heads, which are often geminate, and for its remarkably long achenes. There are three similar specimens collected by Groves and labelled 'Sgoran Dubh, 1890', in the *graniticolum* cover in Herb. Hanbury.

Distribution.—96. E. Inverness: Glen Eunach (Groves).

Endemic.

10. *HIERACIUM GRANITICOLUM* W. R. Linton in Journ. Bot. xxxi. 145 (1893), Hanb. in Bab. Man. ed. 9, 234 (1904); *H. gracilentum* var. *graniticolum* W. R. Lint. Brit. Hier. 15 (1905); *H. nigrescens* subsp. *graniticolum*, Zahn, l. c. 654 (1921).

Exsicc.—Linton, Ben Macdui, 1884; Linton, Glen Avon, Banff, 1889 and 1897; Marshall no. 2160; all in Hb. Mus. Brit.

Stem 15-30 cm. high, with \pm numerous, whitish, dark-based pilose hairs, becoming floccose and with fine, dark glandular hairs above. *Radical leaves* rather small, \pm numerous, *light green*; the primordial subrotund-oval to oval, rounded-obtuse, subentire or denticulate, shortly narrowed below; the later *oblong*, rounded-obtuse to subacute, *irregularly sinuate-dentate* in the lower half with blunt, often spreading teeth, *abruptly or gradually narrowed to the petioles*; stem-leaves 1-3, small, the lowest linear-lanceolate, subacute, entire, sessile, the others linear, bractlike; all *with scattered, stiff pilose hairs* on both surfaces but chiefly above (the primordial sometimes glabrescent), with ciliate margins and pilose petioles; the glandular hairs of the lamina very few. *Heads solitary (rarely 2-3)*, large, rounded below. *Phyllaries incumbent in bud*, blackish green, the outer appressed, lanceolate-subulate, acute or the innermost finely acuminate, slightly senescent, *with dense, long, dusky, dark-based pilose hairs*, eglandular. *Ligules light yellow, pilose-tipped and with some pilose hairs on the back*. *Styles yellow*. Margins of receptacle-pits not seen. *Achenes reddish black*, about 3.5 mm. long.

H. graniticolum is a rare plant apparently confined to the Cairngorm district. It seems to be sufficiently distinct in its basal rosette of rather small, obtuse, sinuate leaves and its relatively tall scape on which only small, bractlike leaves are developed.

Distribution.—92. S. Aberdeen: Loch Etchachan (Linton). 94. Banff: Glen Avon (Linton).

Endemic.

Series **Nigrescentia** (see page 39).

11. **HIERACIUM GRACILENTUM** Backhouse, Mon. 24 (1856); Fries, *Epicr.* 44 (1862); Hanb. Ill. Mon. 26 (1890), and in Bab. Man. ed. 9, 234 (1904); W. R. Lint. Brit. Hier. 14 (1905); *H. nigrescens* γ *gracilentum* Williams, l. c. 100 (1902); *H. nigrescens* subsp. *gracilentum*, Zahn, l. c. 638 (1921).

Icones.—Eng. Bot. ed. 3, t. 828; Hanb. Ill. Mon. pl. 10; Zahn, l. c. fig. 51 A, 1–5.

Exsicc.—Fries, Hier. Eur. no. 2 (Finmark); Backhouse, Glen Isla and Bradoonie, 1855; Linton no. 77 (Corrie Ardran, *partim*); Hanbury, Kingshouse, 1889; Mrs. Wedgwood, Lochnagar, 1924; Marshall no. 3277, as *H. globosum*; all in Hb. Mus. Brit.; Pugsley no. 568 (Tarmechan), in Hb. Pugsley.

Stem 8–20(–30) cm. high, slender, pilose throughout with long and shorter dark, spreading hairs (more densely so above, with normally \pm numerous, fine, dark glandular hairs), sparingly floccose. *Radical leaves* \pm numerous, *bright green*; the primordial small, subrotund-oval, rounded-obtuse-submucronulate, distantly denticulate, shortly contracted below to winged petioles; the later elliptic-lanceolate to linear-lanceolate, obtuse-mucronate to acute, subentire, remotely denticulate or with a few small, spreading or ascending teeth, *attenuate below to \pm long petioles*; stem-leaves 0–2(–4), linear-oblongate to linear, acute, subentire, sessile, the lower sometimes long; all with \pm long, stiff pilose hairs on both surfaces (chiefly above), margins and petioles; the lamina also sparingly clad with fine, short, yellow-headed glandular hairs. *Heads solitary* (or 2–3 ap. Backhouse), of medium size to rather large, rounded below. *Phyllaries* incumbent in bud ap. Hanbury, \pm numerous, blackish-green, all linear-lanceolate, subacute, senescent, *with dense, long, dusky pilose hairs* and generally a few short, dark glandular hairs intermixed. *Ligules with few pilose hairs towards the tips*. Styles light livid or yellowish. Margins of receptacle-pits shortly dentate. Achenes reddish black, 3–3.5 mm. long.

H. gracilentum closely resembles *H. alpinum* but differs in its slenderer habit, less shaggy stem and foliage, blacker heads with shorter hair-clothing and \pm discoloured styles. According to both Backhouse and Hanbury, in cultivation it becomes more vigorous and branches from every leaf-axil, while *H. alpinum*, which is more difficult to grow successfully, never bears more than a single head.

Distribution.—88. Mid Perth: Tarmechan! Ben Heasgarnich (Groves). Ben Lawers (Riddelsdell). 89. E. Perth: Glen Thulachan (Druce). 90. Forfar: Glen Fiagh (Linton). Glen Dole (Burkill). Clova and Glen Isla (Backhouse). 92. S. Aberdeen: Lochnagar (Mrs. Wedgwood). Glen Callater (Monnell). Ben-a-Bournd and Loch Etchachan (Linton). Ben Macdui (Hanbury). 98. Argyll: Kingshouse (Hanbury). Glen Etive (Marshall). 108. W. Sutherland: Canisp (Marshall).

General Distribution.—Norway (Backhouse). Finmark.

12. **HIERACIUM GLOBOSIFLORUM** Pugsley in Journ. Bot. lxxix. 178 (1941); *H. globosum* Backh. Mon. 26 (1856); Fries, *Epicr.* 43 (1862); Hanb. Ill. Mon. 29 (1890), and in Bab. Man. ed. 9, 235 (1904); Williams, l. c. 101 (1902); W. R. Lint. Brit. Hier. 15 (1905); *H. nigrescens* subsp. *globosum*, Zahn, l. c. 653 (1921); non *H. globosum* Desf. Cat. Hort. Paris, 3 (1829).

Icones.—Eng. Bot. ed. 3, t. 829; Hanb. Ill. Mon. pl. 11; Zahn, l. c. pl. 51 E, 1–5.

Exsicc.—Backhouse, Little Craighindal, Cairngorm and Cairntoul, 1855; Linton no. 54 (Little Craighindal and Corrie Etchachan); Groves, Larig Pass, 1886; all in Hb. Mus. Brit.

Stem 10–20(–30) cm. high, \pm slender, sparingly pilose and floccose below, more densely so above (with long, dark-based hairs), and also with \pm numerous, fine, dark glandular hairs interspersed. *Radical leaves* dull *caesious* or glaucescent green, usually small and \pm numerous; the primordial broadly ovate, rounded-obtuse, remotely

denticulate, abruptly narrowed below to short petioles; the later *oval* to oblong or lanceolate, obtuse to acute, *denticulate* to finely sinuate-dentate in the lower half, \pm *attenuate* below to *normally short petioles*; stem-leaf 0-1 (rarely 2), usually linear, small and bractlike, the lowest occasionally larger, linear-lanceolate, entire, sessile; all *with scattered pilose hairs* on both surfaces or frequently glabrescent, with ciliate margins and pilose petioles; fine, yellowish glandular hairs also present on the lamina. *Head solitary, or rarely 2-3, large, broad, and rounded below, spherical in bud. Phyllaries* incumbent in bud, blackish green, numerous with the outer appressed, linear-lanceolate, attenuate, acute, *densely clothed with long, dusky, dark-based pilose hairs*, with a few, short, fine glandular hairs intermixed. *Ligules* \pm *pilose-tipped*. *Styles yellow*. Margins of receptacle-pits shortly and sparingly dentate. Achenes reddish black, 3.5-4 mm. long.

β . lancifolium var. nov.

Exsicc.—Marshall no. 2042 (Ben Loyal) (type), in Hb. Mus. Brit.

Folia radicalia lanceolata ad lineari-lanceolata, subacuta, subintegra vel dentibus tenuibus cuspidatis praedita. Involucra quam in typo minus rotundata; squamae viridi-marginatae, eglandulosae.

Radical leaves (except primordial) lanceolate to linear-lanceolate, subacute, subtire or with fine, cusped or ascending teeth. Heads less rounded than in the type, with green-edged, eglandular phyllaries.

γ . larigense var. nov.

Exsicc.—Pugsley no. 567 (Larig Pass) (type) and no. 566 (Craig Leacain); both in Hb. Pugsley.

Caulis \pm robustus, saepe pilis longissimis basi atris vestitus. Folia radicalia pilis longis rigidis in laminâ marginibusque longe ciliatis, intima nonnunquam grosse dentata. Capitula magna, latissima. *Styli lividi*. Aliter ut in typo.

Stem \pm robust, often pilose with very long, dark-based hairs. Radical leaves with long, stiff pilose hairs and long-ciliate margins, the innermost sometimes coarsely toothed. Heads large and very broad. *Styles livid*.

H. globosiflorum is allied to *H. gracilentum*, but differs in its caesious foliage with less developed stem-leaves, and its more globose heads with long, attenuate phyllaries. In the cover of this species in Herb. Backhouse are some remarkably large specimens with deeply cut foliage.

The variety *larigense* was collected in considerable quantity in 1890 and 1894 by Henry Groves in different parts of the Larig Pass, near Braemar.

Distribution.—90. Forfar: Clova (Linton). 92. S. Aberdeen: Cairntoul, Cairngorm and Little Craigindal (Backhouse). Ben-a-Bourd (Linton). 94. Banff: Glen Avon (Linton). 96. E. Inverness: Glen Eunach and Larig Pass (Groves). 108. W. Sutherland: Ben Hope and Canisp (Marshall).

var. *lancifolium*.

108. W. Sutherland: Ben Loyal (Marshall).

var. *larigense*.

96. E. Inverness: Larig Pass and Craig Leacain (Groves).

General Distribution.—Norway and Lapland, ap. Hanbury.

Fries's specimen of *H. nigrescens* Willd. in Herb. Mus. Brit. (Hb. Norm. x. 8), and also Fries, Eur.*Hier. no. 2, in part, both from Finmark, seem to be *H. globosiflorum*.

13. *HIERACIUM PSEUDO-PETIOLATUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925). *H. petiolatum* Hanb. in Journ. Bot. xxxii, 225 (1894), and in Bab. Man. ed. 9, 234

(1904) ; Williams, l. c. 102 (1902) ; W. R. Lint. Brit. Hier. 15 (1905) ; non Elfstrand, Bot. Utfl. 36 (1890) ; *H. nigrescens* subsp. *pseudo-petiolatum* Zahn, l. c. 645 (1921).

Exsicc.—Linton no. 53 (Corrie Etchachan), in Hb. Mus. Brit.

Stem 8–20 cm. high, slender and somewhat flexuous, with long, whitish, spreading pilose hairs throughout, and \pm floccose, with very few, fine glandular hairs above. *Radical leaves* not numerous, green, tinted sometimes with purplish (metallic ap. W. R. Linton) ; the primordial obovate-lanceolate, rounded-obtuse-mucronulate, subentire, cuneate-based ; the later lanceolate, \pm acute, generally with a few distant, irregular, shallow, spreading teeth, attenuate below to rather long, slender, red-based petioles ; stem-leaves 2–3, the lowest generally small, linear-lanceolate, acute, entire and sessile, the upper linear and bractlike ; all with numerous, long, stiff pilose hairs on both surfaces, margins and petioles ; a few, fine, yellowish glandular hairs on the lamina. *Head solitary, rather large*, scarcely rounded below. *Phyllaries* incumbent in bud, blackish green, rather narrow, linear-subulate, acute, senescent, with \pm dense, long, whitish, dark-based pilose hairs, nearly eglandular. *Ligules sparingly pilose-tipped*. *Styles dark livid*. Margins of receptacle-pits incise-dentate. Achenes reddish black, about 3.5 mm. long.

This plant is described from material collected by Loch Etchachan, near Ben Macdui, the station where it was originally found by Hanbury. Other exsiccateae, similarly named, obtained on Cairngorm and Ben-a-Bour, appear to be forms of *H. alpinum*.

H. pseudo-petiolatum is allied to *H. gracilentum* and is said by Hanbury to develop similarly under cultivation and produce lateral branches. In the form of its radical leaves it also recalls *H. Backhousei* Hanb. *H. petiolatum* Elfstr. (Bot. Utfl. 36 (1890)), with which it was first identified, differs essentially in its more rounded and somewhat glabrescent foliage.

Distribution.—92. S. Aberdeen : Loch Etchachan (Hanbury).

Endemic.

14. *HIERACIUM BACKHOUSEI* F. J. Hanbury in Journ. Bot. xxvii. 74 (1889) ; Ill. Mon. 37 (1891) ; in Bab. Man. ed. 9, 236 (1904) ; Williams, l. c. 103 (1902) ; W. R. Lint. Brit. Hier. 16 (1905) ; *H. nigrescens* subsp. *Backhousei* Zahn, l. c. 663 (1921).

Icones.—Hanb. Ill. Mon. pl. 13 ; Zahn, l. c. fig. 51 c.

Exsicc.—Hanbury, Cairntoul, 1886, and Dhuloch, 1887 ; Groves, Glen Eunach, 1890 ; Linton no. 55 (Ben Socaich and Coire-an-Easain Mor) ; all in Hb. Mus. Brit.

Stem 10–30(–40) cm. high, flexuous, with scattered, spreading, dark-based pilose hairs, also floccose and with some short, dark glandular hairs above. *Radical leaves deep green* ; the primordial small, oval, rounded-obtuse, denticulate or toothed below, cuneate-based ; the later elongate, oblanceolate to lanceolate, obtuse-mucronate to acute, denticulate in dwarf plants or in stronger plants with long, ascending, cusped teeth in the lower half (sometimes almost lacinate), attenuate below to \pm winged petioles ; stem-leaves (1–)2–3, the lowest (usually placed low) linear-lanceolate, acuminate, with a few long, sharp teeth, sessile, the upper linear, entire, \pm bractlike ; all with \pm numerous, rather long pilose hairs on both surfaces or sometimes glabrescent above, with long-ciliate margins and pilose petioles ; a few glandular hairs also present on the lamina. *Heads often solitary*, but sometimes 2–3(–6 cult.), on long, erect-spreading, pilose, floccose and glandular peduncles, large and rounded below. *Phyllaries* incumbent in bud, blackish green, lanceolate-subulate, acute, slightly senescent, with dense, rather long, whitish, dark-based pilose hairs and a few fine glandular hairs intermixed. *Ligules sparingly pilose-tipped*. *Styles fuscous*. Margins of receptacle-pits incise-dentate. Achenes reddish black, about 3.5 mm. long.

H. Backhousei is characterized by long, narrow, deep green leaves, rarely very hirsute, with long, ascending teeth in the lower half. Although small individuals usually produce a single head, wild specimens with 2-3 heads are not rare, and in cultivation the plant becomes much more luxuriant with as many as six heads.

Distribution.—88. Mid Perth : Ben Heasgarnich (Groves). Luib (Linton). 92. S. Aberdeen : Cairntoul and Dhuloch (Hanbury). 94. Banff : Loch Aan (Druce). 96. E. Inverness : Glen Eunach (Groves). 97. W. Inverness : Ben Nevis! Ben Socaich (Marshall). 106. E. Ross : Ben Wyvis (Marshall).

Endemic ?—A similar plant occurs in Greenland according to Zahn.

15. *HIERACIUM PSEUDO-CURVATUM* (Zahn) Pugsley in Journ. Bot. lxxix. 178 (1941); *H. nigrescens* Backh. Mon. 28 (1856); Fries, Epier. 44 (1862), ex parte; Hanb. Ill. Mon. 32 (1890); non Willd. nec Zahn; *H. nigrescens* var. *curvatum* Williams, l. c. 100 (1902); *H. curvatum* Hanb. in Journ. Bot. xxxii. 226 (1894), and in Bab. Man. ed. 9, 236 (1904); W. R. Lint. Brit. Hier. 16 (1905); non Elfstrand; *H. nigrescens* subsp. *pseudo-curvatum* Zahn, l. c. 660 (1921).

Icon.—Hanb. Ill. Mon. pl. 12, fig. sinistr., as *H. nigrescens*.

Exsicc.—Backhouse, Cairntoul, 1855 (type), as *H. nigrescens*; Linton, Little Craigindal; Marshall no. 2029; all in Hb. Mus. Brit.

Stem 10-30(-40) cm. high, with scattered, dark-based pilose hairs below, becoming more pilose and also floccose upwards, with \pm numerous, fine, dark glandular hairs. *Radical leaves* numerous, *light green*; the primordial small, subrotund to oval, rounded-obtuse, subentire or with a few shallow teeth, shortly narrowed below; the later of medium size, very variable in form, *elliptic-ovate* to lanceolate, obtuse to acute, shallowly sinuate-dentate to coarsely and *irregularly serrate-dentate* with spreading teeth, *abruptly or gradually contracted below* to normally short, winged petioles; stem-leaves 1-2, usually small and bractlike, rarely larger and resembling the inner basal; all rather *softly pilose* on both surfaces with ciliate margins and pilose petioles; some scattered fine, yellowish glandular hairs also present on the lamina. *Heads large to very large*, generally solitary (rarely 2-3), broad, rounded below. *Phyllaries* incumbent in bud ap. W. R. Linton, blackish, numerous, lanceolate-subulate, acute (the inner finely acuminate), slightly senescent, *with dense, dusky, dark-based pilose* and a few fine, dark glandular hairs. *Ligules slightly pilose-tipped*. *Styles fuscous*. Margins of receptacle-pits sharply dentate. Achenes reddish-black, 4-4.5 mm. long.

This plant, at first referred to *H. nigrescens* Willd., was transferred by Hanbury (Journ. Bot. xxxii. 226) to *H. curvatum* Elfstrand. Zahn does not agree that this plant is identical with Elfstrand's species, which he regards as belonging to his super-species *H. atratum* Fr. while the British form is connected with *H. nigrescens* although not identical with it in a segregate sense. Zahn therefore re-names our plant *H. pseudo-curvatum*. Authentic material of *H. curvatum* Elfstr. (Dahlst. Hier. Eur. iv. 49) in Herb. Mus. Brit. shows that it is allied to *H. atratum* Fr. while the British plant is clearly different, and Zahn's treatment is therefore here followed.

Zahn also gives the true *H. curvatum* Elfstr. as occurring in Scotland and cites Hanbury's figure (pl. 12) for this as well as for *H. pseudo-curvatum*. The plate shows two plants, of which the right-hand one may represent *H. curvatum*. No certain British specimens of *H. curvatum* have been seen, but a plant collected on Slioch, in West Ross, by C. E. Salmon in 1896, and named '*H. atratum* Fr.?' by Linton, resembles it.

Under *H. pseudo-curvatum* Zahn cites (l. c.) the exsiccata Linton no. 79 (Little Craigindal). The sheet of this number and place in Herb. Mus. Brit., however, shows

specimens of *H. calenduliflorum* Backh., similar to those distributed from Aonach Beg. But there is also in Herb. Mus. Brit. a good sheet of *H. pseudo-curvatum* collected by Linton on the Little Craigindal on the date printed on the label of the set no. 79, so that it seems likely that some mixture of specimens has taken place, and that the example seen and cited by Zahn was not *H. calenduliflorum* as on the sheet in Herb. Mus. Brit., but the correct plant.

H. pseudo-curvatum is a handsome plant when well developed.

Distribution.—88. Mid Perth : Corrie Ardran ! Meal Tarmechan (Slatter). 89. E. Perth : Glen Shee (Linton). 90. Forfar : Loch Brandy, Loch Esk and Clova (Linton). Glen Caness (Hanbury). 92. S. Aberdeen : Cairntoul (Backhouse). Little Craigindal and Ben-a-Bourd (Linton). 96. E. Inverness : Glen Eunach (Groves). 108. W. Sutherland : Ben Loyal (Marshall).

Endemic.

16. *HIERACIUM NIGRESCENS* Willdenow, Sp. Pl. ed. 3, iii. 1574 (1800) ; Fries, Epicr. 44 (1862), ex parte ; non auct. angl. ; *H. nigrescens* subsp. *nigrescens* Zahn, l. c. 664 (1921).

Icon.—Rchb. Icones Fl. Germ., etc. ii. (1906–9), pl. 141 A.

Exsicc.—Petrak, Fl. Bohem. no. 285 (Riesengebirge) ; Polak, Weisse Wiese, Riesengebirge, 1887 ; Baenitz, Riesengrund, 1869 ; all in Hb. Mus. Brit.

Stem 15–35 cm. high, \pm slender, with dark-based pilose hairs throughout, becoming floccose with dense, dark glandular hairs above. *Radical leaves* \pm caesious green, not very numerous ; the primordial small, rotund-oval, rounded-obtuse, scarcely toothed, abruptly contracted below ; the later oval, obtuse, with \pm coarse, broad, spreading, unequal teeth, shortly contracted below to long petioles ; stem-leaf usually one, small, linear-lanceolate or linear, \pm bractlike, all with scattered pilose hairs on both surfaces, with some fine, yellowish glandular hairs ; margins ciliate and petioles pilose. *Heads solitary*, or 2–5 (–10, ap. Zahn), on long peduncles, large, scarcely rounded below. *Phyllaries* incumbent in bud, blackish green, linear-oblong, mostly obtuse, with dense, dusky, dark-based pilose and numerous shorter, dark glandular hairs. *Ligules* pilose-tipped. *Styles* fuscous.

The name *H. nigrescens* Willd. has been applied to a number of British and Scandinavian hawkweeds of this group with blackish flower-heads, but has been restricted by Zahn, and apparently correctly in a segregate sense, to a plant of the Riesengebirge and adjoining districts which is represented by the above-cited *exsiccatae*. This plant is allied to *H. pseudo-curvatum* and to the next species, *H. Hanburyi*. Its heads resemble those of the former, but are rather smaller and more glandular, and its long-petioled foliage is quite distinct and somewhat recalls that of *H. Hanburyi* except that its teeth are shorter, broader and less irregular. No British specimens of *H. nigrescens* have been traced, and the above description has been compiled from German examples, but as Zahn (l. c.), in stating its distribution, adds ‘Ahnlich, Scotland, Carntoul (Marshall) !’ it seems desirable to admit it, at least provisionally, in the British list.

In Hanbury’s Monograph *H. nigrescens* Willd. appears on page 32, with a copious synonymy and an accompanying plate (no. 12). This was issued, without a description, in 1890, but shortly afterwards it was discovered that the plant illustrated was not *H. nigrescens* and no further text was published. The plate is noticed under *H. pseudo-curvatum* (Zahn).

General Distribution.—Germany.

17. *HIERACIUM HANBURYI* Pugsley in Journ. Bot. lxxix. 178 (1941); *H. chrysanthum* Backhouse in Hooker and Arnott, Brit. Fl. 220 (1855), and Mon. 34 (1856); Hanb. Ill. Mon. 49 (1894), and in Bab. Man. ed. 9, 237 (1904); Williams, l. c. 106 (1902); W. R. Lint. Brit. Hier. 18 (1905); *H. nigrescens* subsp. *chrysanthum* Zahn, l. c. 663 (1921); non *H. chrysanthum* Ledebour, Fl. Altaica, iv. 129 (1853).

Icones.—Eng. Bot. ed. 3, t. 830; Hanb. Ill. Mon. pl. 17; Zahn, l. c. fig. 51 D, 1-4; Pl. 1, fig. c.

Exsicc.—Backhouse, Cairntoul, Dhuloch and Ben-a-Bourd, 1855; Linton no. 5 (Clova); Linton, Glen Callater, 1884; Groves, Larig Pass and Glen Eunach; all in Hb. Mus. Brit.

Stem 10-20(-30) cm. high often slender, with scattered, whitish pilose hairs below, becoming densely floccose above, with numerous, dark, unequal glandular and pilose hairs in varying proportions. *Radical leaves bright green*, rarely numerous; the primordial broad, subrotund- or elliptic-ovate, rounded-obtuse-mucronulate, shallowly sinuate-dentate, shortly cuneate to subtruncate-based; the later *oval* to elliptic-lanceolate or lanceolate, obtuse-mucronulate to acute, remotely sinuate-dentate to deeply and *irregularly incise-dentate* with long, spreading or cusped teeth, *attenuate below* to \pm long, slender petioles; stem-leaves (0-)1-3(-5 cult.), the lowest often long, linear-lanceolate (rarely lanceolate), acute, entire or with a few long, asymmetrical teeth, long-attenuate below and subpetiolate, the upper smaller, linear-lanceolate, \pm bractlike; all with \pm numerous, rather short pilose hairs on both surfaces, with some fine, yellowish glandular hairs interspersed, margins ciliate and petioles villous. *Heads generally solitary*, but sometimes 2-4(-6 cult.), on long, erect-spreading peduncles springing from the axils of the stem-leaves, *large* or very large, broad and rounded below, nodding in bud. *Phyllaries* incumbent in bud, blackish green, numerous, linear-lanceolate, mostly acute, senescent, *densely clothed with unequal, dark glandular and longer, dusky pilose hairs*, the latter generally the more numerous. *Ligules* golden yellow, *sparingly pilose-tipped*. *Styles yellow*. Margins of receptacle-pits shortly dentate. Achenes blackish, 3.5-4.5 mm. long.

β . microcephalum (Backh.) comb. nov.

H. chrysanthum var. *microcephalum* Backh. Mon. 34, ex parte, emend.; Hanb. Ill. Mon. 51, ex parte; Williams, l. c.; W. R. Lint. l. c.

Icones.—Eng. Bot. ed. 3, t. 831; Hanb. Ill. Mon. pl. 18, fig. dextr.

Exsicc.—Linton, Loch Wharral, 1890 (type); E. G. Baker, Lochnagar, 1893; both in Hb. Mus. Brit.

Stem taller (-40 cm.), slender. Radical and lowest stem-leaves more acute, and more closely and evenly dentate. Heads 1-3(-5 cult.), of medium size, narrower than in the type. *Styles light livid*.

γ . atraticeps var. nov.

H. chrysanthum var. *microcephalum* Backh. Mon. 34, ex parte; Hanb. Ill. Mon. 51, ex parte; *H. atratum* W. R. Lint. Brit. Hier. 19 (1905), ex parte?

Icon.—Hanb. Ill. Mon. pl. 18, fig. sinistr.

Exsicc.—Linton, Lochnagar, 1887 (type); Riddelsdell, Lochnagar, 1889; Backhouse, Lochnagar, 1855; all in Hb. Mus. Brit.

Caulis 15-35 cm., gracilis, quam in typo minus floccosus sed majus glandulosus. Capitula 1-5, mediocria ad majuscula, lateralia pedunculis longis tenuibus suberectis suffulta. Squamae glandulis densis imparibus obscuris vestitae, vix pilosae. Styli latei. Aliter ut in typo.

Stem 15-35 cm. high, slender, less floccose and more glandular than in the type. Heads 1-5 (the lateral on long, slender, suberect peduncles), of medium size or rather large. Phyllaries with dense, unequal, dark glandular hairs, nearly or quite epilose. Styles yellow. Otherwise as in the type.

δ. humile var. nov.

Exsicc.—Linton, Cairnwell in Hb. Mus. Brit.; Pugsley nos. 564 (type) and 565, in Hb. Pugsley.

Caulis 8–15(–25) cm., gracilis. Folia radicalia parva, dentibus paucis grossis patulis haud altis praedita, basi \pm cuneata, pilis rigidis sparsis hirsuta. Involucra mediocria ad magna, inferne rotundata, haud lata; squamae lineari-oblongae, elongatae, plurimae obtusae. Aliter ut in typo.

Stem 8–15(–25) cm. high, slender. Radical leaves small, the later with a few, coarse, shallow, spreading teeth, \pm cuneate-based, clothed with scattered, stiff pilose hairs. Heads of medium size to large, rounded below but not broad; phyllaries linear-oblong, elongate, mostly obtuse. Otherwise like the type.

It is a matter of possible regret that the well-known name of *H. chrysanthum* Backhouse has to be relegated to synonymy owing to the existence of an earlier *H. chrysanthum* of Ledebour. The new name *H. Hanburyi* is proposed because the late Mr. F. J. Hanbury has been commemorated in the genus only by a name *H. Hanburyanum*, which has proved invalid. Mr. Hanbury was especially interested in the group *Alpina*, and *H. chrysanthum* was one of his favourite species.

H. Hanburyi is one of the most beautiful of Alpine hawkweeds, readily recognizable by its singularly irregular leaf-cutting, and its golden heads with velvety black involucre, which lack the shaggy or silky clothing of many of its allies and are definitely more glandular.

It seems necessary to subdivide Backhouse's variety *microcephalum* into two groups, as while both produce relatively small heads, one form is distinguished by its more closely dentate foliage and the other is characterized by its densely glandular, almost epilose phyllaries.

The variety *humile* is a dwarf plant with less toothed leaves that has often been collected as *H. globosiflorum*; and there is a sheet of specimens from the Little Craigindal, so named in Herb. Hanbury, on which Elfstrand dissents from the naming. The heads of the variety are unmistakably those of *H. Hanburyi*.

Distribution.—88. Mid Perth: Ben More (Marshall). Ben Lawers (McRitchie). 89. E. Perth: Glen Thulachan (Riddelsdell). Glen Shee (Linton). 90. Forfar: Clova and Canlochen (Linton). 92. S. Aberdeen: Ben Macdui (Hanbury). Lochnagar! Cairntoul, Dhuloch and Ben-a-Bourd (Backhouse). Glen Callater! 94. Banff: Ben Avon and Cairngorm (Marshall). 96. E. Inverness: Glen Eunach and Larig Pass (Groves). 97. W. Inverness: Fersit Forest and Aonach Beg (Marshall).

var. *microcephalum*.

90. Forfar: Loch Wharral (Backhouse). 92. S. Aberdeen: Lochnagar (Backhouse). Glen Callater and Cairntoul (Syme).

var. *atriceps*.

92. S. Aberdeen: Lochnagar (Backhouse).

var. *humile*.

88. Mid Perth: Meal Ghaordie (Slatter). 89. E. Perth: Cairnwell (Linton). 90. Forfar: Glen Fiagh! 92. S. Aberdeen: Little Craigindal! 96. E. Inverness: Glen Eunach (Groves).

Endemic.

18. *HIERACIUM SUBGRACILENTIPES* (Zahn) Roffey in Lond. Cat. ed. 11 (1925); *H. chrysanthum* var. *gracilentiforme* Hanb. in Journ. Bot. xxx. 167 (1892); Ill. Mon. 52 (1894); in Bab. Man. ed. 9, 238 (1904); Williams, l. c. 106 (1902); W. R. Lint. Brit. Hier. 18 (1905); *H. nigrescens* subsp. *subgracilentipes* Zahn, l. c. 660 (1921).

Exsicc.—Ridley, Helvellyn, 1881 ; Fox, Helvellyn, 1890 ; Ley, Helvellyn, 1905 ; Marshall no. 4320 (Laggan) ; all in Hb. Mus. Brit. ; Pugsley no. 569 (Sron-an-lochain), in Hb. Pugsley.

Stem 12–35 cm. high, \pm slender, with scattered, spreading, dark-based pilose hairs from the base upwards, becoming floccose and with numerous, short, dark glandular hairs above. *Radical leaves pale green*, numerous ; the primordial small, broadly oval, rounded-obtuse or subtruncate, slightly sinuate-dentate, shortly cuneate-based ; the later obovate- to *elliptic-lanceolate* or lanceolate, obtuse to acute, denticulate to coarsely *serrate-dentate* with sharp, ascending teeth, *gradually attenuate below* to slender, winged petioles ; stem-leaves (0–)1–3, the lowest linear-lanceolate or linear, acute, subentire, attenuate below, the upper smaller, linear, becoming bractlike ; all *with scattered, short pilose* and a few fine, yellowish glandular hairs on both surfaces, the margins ciliate and petioles long-pilose. *Heads usually solitary* (occasionally 2 on long peduncles), *large*, slightly rounded below. *Phyllaries* incumbent in bud, blackish green, linear-lanceolate, elongate, acute or the innermost finely acuminate, slightly senescent, *with dense, long, dusky, dark-based pilose hairs* with some short, dark glandular hairs intermixed. *Ligules with many pilose hairs on the back and strongly pilose-tipped*. *Styles livid*. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3.5 mm. long.

This plant is somewhat intermediate between *H. Hanburyi* and *H. gracilentum*. It differs from the former in its pale green, narrower and less cut foliage, and its narrower heads with very pilose ligules and livid styles. From *H. gracilentum* it may be distinguished by its stronger growth and larger heads with elongate, acute phyllaries and more pilose ligules.

The specimens collected by Marshall in 1916 near Laggan in West Inverness (no. 4320), are labelled '*H. chrysanthum*' and annotated 'Differs from normal plant in having livid styles and pilose-tipped ligules'.

Distribution.—69. Westmorland : Helvellyn ! Dollywaggon Pikes (Fox). 97. W. Inverness : Laggan and Stob-Coire-an-Easain (Marshall). Sron-an-lochain !

Endemic.

Sect. III. SUBALPINA sect. nov.

Sect. *Alpina** *Hypophyllopodu* Fries, Epicr. 45 (1862) ; *Alpina-Nigrescentia* (partim), *Alpina-Hyparctica* and *Vulgata-Sylvatica* (partim), W. R. Lint. Brit. Hier. 2, 3 (1905) ; *Alpina-Oreadea*, *Alpina-Vulgata* and *Alpina-Bifida* (partim) Zahn, l. c. 635, 636 and 699 (1921).

Folia radicalia plerumque pauca. Anthela \pm racemoso-corymbosa. Ligulae vulgo apice pilosae.

Scapigerous plants with green foliage. Radical leaves rarely numerous, clothed with pilose hairs, among which a few fine, yellowish glandular hairs are generally present, very rarely floccose. Stem \pm pilose, with few, often small, non-amplexicaul leaves. Inflorescence \pm racemose-corymbose. Heads of medium size to large, normally 2–5, rounded below (except in *H. centripetale*, *H. hyparcticoides* and *H. Isabellae*), with phyllaries pilose and glandular in varying proportions, often effloccose, incumbent or more rarely porrect in bud. Ligules usually pilose-tipped. Styles yellow to livid. Margins of receptacle-pits shortly dentate to subulate-dentate (or dentate-fimbriate in *H. cumbriense* and *H. Isabellae*).

Flowering July–August.

The plants placed in this Section are allied to the *Alpina* and nearly always show traces of foliar glandular hairs. Their inflorescence is normally more than

one-headed and more and less racemose-corymbose in form. They show some approach to species of the Section *Vulgata* (especially Subsection *Glandulosa*) or more rarely to the *Oreadea* or *Cerinthoidea*.

The general geographical distribution of these species nearly coincides with that of the *Alpina* but is less definitely Arctic and Alpine. In Britain they are confined to the Scottish mountains, with the exception of *H. cumbriense*, of the English Lake District, and *H. senescens*, which appears to occur very rarely in County Down, in Ireland. They grow in similar situations to the Alpine species, always high on the hills.

Series *Senescentia* [Grex *H. senescens* Backh.]. Heads \pm large, dark.

* Heads pilose and only slightly glandular.

- | | |
|---|---------------------------|
| Radical leaves long, lanceolate, subentire, stiffly pilose. Phyllaries broad, acute, porrect in bud. Styles livid or yellow | <i>H. lingulatum</i> . |
| Radical leaves oval, with spreading teeth, softly pilose. Phyllaries obtuse. Styles yellow to fuscous | <i>H. molybdochroum</i> . |
| Radical leaves oblong, denticulate, \pm pilose. Heads broad, with broad, obtuse phyllaries. Styles yellowish | <i>H. Marshallii</i> . |
| Radical leaves lanceolate, coarsely dentate, pilose, apparently eglandular. Phyllaries rather broad, acute. Styles livid | <i>H. cremnanthes</i> . |

** Heads strongly glandular as well as pilose.

- | | |
|---|---------------------------|
| Radical leaves oblong, sinuate-dentate, glabrescent. Phyllaries broad, obtuse. Styles livid | <i>H. sinuans</i> . |
| Radical leaves oval to lanceolate, denticulate to dentate, \pm pilose. Phyllaries acute, senescent. Styles yellow | <i>H. senescens</i> . |
| Radical leaves oblong, denticulate, slightly pilose, apparently eglandular. Heads narrow, with long, acute, very glandular phyllaries. Styles light livid | <i>H. pseudanglicum</i> . |

Series *Atrata* [Grex *H. atratum* Fr.]. Heads of medium size, dark, densely glandular.

- | | |
|--|---------------------------|
| Radical leaves oblong-lanceolate, denticulate, shortly pilose. Phyllaries rather broad, obtuse, epilose. Ligules glabrous-tipped. Styles yellow to livid | <i>H. gracilifolium</i> . |
| Radical leaves oval, sinuate-dentate, pilose. Phyllaries obtuse, \pm pilose. Styles livid | <i>H. submurorum</i> . |
| Radical leaves elliptic, denticulate, \pm pilose. Phyllaries subacute, pilose, porrect in bud. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits dentate-fimbriate | <i>H. cumbriense</i> . |
| Radical leaves elliptic-lanceolate, sharply serrate, softly pilose. Phyllaries narrow, acute, slightly pilose. Styles livid | <i>H. centripetale</i> . |

Series *Hyparctica* [Grex *H. hyparcticum* Alm.]. Heads of medium size, attenuate below.

- | | |
|---|----------------------------|
| Radical leaves oblong, denticulate, pilose, floccose beneath, apparently eglandular. Phyllaries dark, glandular and somewhat pilose, porrect in bud. Ligules pilose-tipped. Styles fuscous | <i>H. hyparcticoides</i> . |
| Radical leaves elliptic-lanceolate, sharply dentate, pilose. Phyllaries olive-green, obtuse, pilose and shortly glandular. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits dentate-fimbriate .. | <i>H. Isabellae</i> . |

Series *Callistophylla* [Grex *H. callistophyllum* Hanb.]. Heads of medium size, rather dark, densely pilose. Leaves apparently eglandular, ligules glabrous-tipped.

- | | |
|--|-----------------------------|
| Radical leaves obovate, sharply dentate, roughly pilose. Phyllaries obtuse, slightly glandular. Styles yellow or light livid | <i>H. callistophyllum</i> . |
| Radical leaves ovate-lanceolate, denticulate, pilose. Phyllaries broad, obtuse, slightly glandular. Styles yellow | <i>H. dasythrix</i> . |

Series **Senescentia**. (See page 54.)

19. *HIERACIUM LINGULATUM* Backhouse in Hooker and Arnott, Brit. Fl. 221 (1855), and Mon. 30 (1856); Fries, Epicr. 45 (1862); Hanb. Ill. Mon. 40 (1891), and in Bab. Man. ed. 9, 236 (1904); Williams, l. c. 104 (1902); W. R. Lint. Brit. Hier. 17 (1905); *H. nigrescens* subsp. *lingulatum* Zahn, l. c. 668 (1921).

Icones.—Eng. Bot. ed. 3, t. 834; Hanb. Ill. Mon. p. 14.

Exsicc.—Backhouse, Cairntoul, Corrie Etchachan and Clova, 1855; Linton no. 2 (Clova); Marshall no. 3275; Hanbury, Ben Hope; all in Hb. Mus. Brit.

Stem (15-)25-40(-50 cult.) cm. high, slender, flexuous, pilose throughout with spreading, dark-based hairs, \pm floccose above. *Radical leaves* pale green, normally few; the primordial small, oval, obtuse-mucronulate, denticulate or with a few shallow teeth towards the abruptly contracted base; the later often long or very long (-20 cm.), oblong to narrowly oblong-lanceolate or lingulate, obtuse-mucronulate to acute, *subentire* or with some distant denticulations or fine teeth, gradually attenuate below to short or winged petioles; stem-leaves (1-)2-3(-4), the lower long-lanceolate, acute, often with a few shallow teeth towards the sessile and sometimes rounded base, the upper smaller, becoming linear and bractlike; all with \pm numerous, stiff pilose hairs on both surfaces (a few fine, yellowish glandular hairs interspersed), with ciliate margins and long-pilose petioles. Inflorescence furcate- or racemose-corymbose, 2-4(-10 cult.)-headed, or heads solitary in weak plants, with usually rather short, erect-spreading peduncles, which are \pm floccose with many strong, dark-based pilose and a few fine glandular hairs. *Heads of moderate size to large*, rounded below. *Phyllaries porrect in bud, blackish green, broad, lanceolate-subulate, acute*, slightly floccose towards the base, with numerous dusky, dark-based pilose hairs and a few shorter, dark or yellowish glandular hairs intermixed. Ligules sparingly pilose-tipped. *Styles livid or yellow*. Margins of receptacle-pits subulate-dentate. Achenes reddish-black, 3.5-4 mm. long.

This is one of the most distinct and uniform species of the group and the most widely distributed in the Scottish Highlands. Its long, rough leaves are quite unlike those of any of its allies. It appears to have been first noticed by George Don in the Clova district.

Distribution.—88. Mid Perth: Stob Garbh (Marshall). Corrie Ardran! Craig-on-lochan! 89. E. Perth: Glen Shee (Hanbury). 90. Forfar: Clova! Unich Water (Marshall). 92. S. Aberdeen: Cairntoul and Corrie Etchachan (Backhouse). Glen Callater! 94. Banff: Ben Avon (Marshall). 96. E. Inverness: Dalwhinnie (Marshall). 97. W. Inverness: Ben Nevis! Coire Coille! Stob Ban (Marshall). Fersit Forest (Shoolbred). 98. Argyll: Glen Fionne (Marshall). Tyndrum (Groves). Invermoidart (Macvicar). 105. W. Ross: Ben Eay and Slioch (Salmon). 106. E. Ross: Garve (Marshall). 108. W. Sutherland: Inchnadamph (Marshall). Ben Hope (Hanbury).

Endemic.

20. *HIERACIUM MOLYBDOCHROMUM* Dahlstedt in Act. Hort. Berg. ii. 4, 86 (1894); *H. nigrescens* var. *commutatum* Lindbg. in Blytt, Norges Fl. ii. 642 (1874); Hanb. in Journ. Bot. xxx. 131 (1892), and in Bab. Man. ed. 9, 235 (1904); W. R. Lint. Brit. Hier. 19 (1905); *H. atratum* subsp. *molybdochroum* Zahn, l. c. 671 (1921).

Exsicc.—Lindbg. H. Sc. i. 26, as *H. nigrescens*; Hanbury, Cairntoul, 1885, in Hb. Hanbury.

Stem 20-45 cm. high, slightly pilose below, floccose with a few scattered, dark-based pilose or fine glandular hairs above. *Radical leaves* few, bright green; the primordial small, subrotund, rounded-obtuse-mucronulate, slightly sinuate, subtruncate-based; the later oval to elliptic-lanceolate, rounded-obtuse-mucronulate to

subacute, *with few spreading*, often broad or coarse *teeth*, chiefly towards the subtruncate or shortly contracted base; stem-leaves 1-3, the lower lanceolate, acuminate, with a few sharp, ascending teeth below, \pm petiolate, the upper smaller, becoming bractlike; all *with soft pilose hairs* on both surfaces, with ciliate margins and pilose (generally long) petioles (the cauline also \pm floccose); fine, pale glandular hairs present on the lamina. Inflorescence racemose-corymbose, 1-3(-5)-headed, the peduncles very floccose with scattered dark-based pilose and \pm numerous, fine glandular hairs. *Heads large*, rounded below. *Phyllaries* incumbent in bud, *dark olive green*, linear-oblong, mostly *obtus*e but the innermost finely attenuate, senescent, floccose towards the base, with numerous pale, dark-based pilose hairs and fewer, fine, short glandular hairs intermixed. Ligules sparingly pilose-tipped. *Styles livid*.

The only British examples of this species that have been examined are those collected by Hanbury on Cairntoul in 1885. These were published as *H. nigrescens* var. *commutatum* Lindbg. by Hanbury in 1892, after having been presumably named by Lindeberg; and this identification was subsequently accepted both by W. R. Linton and by Zahn. The latter does not appear to have seen the British material. The above description has been drawn up from the exsiccata Lindeberg no. 26, which Zahn identifies with *H. molybdochroum* Dahlst., in conjunction with the fine set of specimens obtained by Hanbury on Cairntoul.

Distribution.—92. S. Aberdeen : Cairntoul (Hanbury).

General Distribution.—Scandinavia.

21. *HIERACIUM MARSHALLII* Linton in Journ. Bot. xxix. 271 (1891); Hanb. Ill. Mon. 47 (1894), and in Bab. Man. ed. 9, 237 (1904); W. R. Lint. Brit. Hier. 17 (1905); *H. chrysanthum* var. *Marshallii* Williams, l. c. 107 (1902); *H. senescens* subsp. *Marshallii* Zahn, l. c. 636 (1921).

Icon.—Hanb. Ill. Mon. pl. 16.

Exsicc.—Marshall, Unich Water, 1888; Linton no. 4 (cult.); Marshall nos. 915 and 4316; all in Hb. Mus. Brit.

Stem (10-)20-35(-50) cm. high, with scattered pilose hairs, chiefly towards the base, becoming floccose upwards. *Radical leaves* yellowish green, not numerous; the primordial oval, rounded-obtus-e-mucronulate, denticulate or obscurely sinuate-dentate, abruptly contracted below; the later (often large) *oblong to elliptic-lanceolate*, obtus-e-mucronulate to acute, *denticulate or with distant, sharp*, spreading or ascending *teeth* in the lower half, shortly contracted below to \pm long petioles; stem-leaves generally 2, the lower (often large) elliptic-lanceolate, acute, with a few sharp teeth, \pm petiolate, the upper small, lanceolate, toothed or entire, sessile, or sometimes bractlike; all *with scattered* or occasionally dense *pilose hairs* on both surfaces, or glabrescent above, with ciliate margins and pilose petioles; very few fine, yellowish glandular hairs present on the lamina. Inflorescence furcate- or sub-racemose, 1-3 (-5 cult.)-headed, with suberect peduncles, which are floccose with scattered, fine glandular and sometimes pale pilose hairs. *Heads large, broad*, sub-truncate-based. *Phyllaries* incumbent in bud, *dark olive green, broad*, linear-lanceolate, mostly *obtus*e, senescent, with dense, whitish, dark-based pilose hairs and some (usually few) fine, dark glandular hairs intermixed. Ligules shortly pilose-tipped. *Styles yellowish*. Margins of receptacle-pits shortly dentate. Achenes reddish-black, about 3.5 mm. long.

H. Marshallii is another handsome species allied to *H. senescens* Backh., from which it differs by its more robust habit, broader and more toothed lower stem-leaf, less diffuse and less glandular inflorescence, and broader heads with more pilose phyllaries and discoloured styles.

Distribution.—88. Mid Perth : Loch-na-Chait (Foggitt). Meal Ghaordie (Linton). 90. Forfar : Unich Water, Corrie Clova and Glen Caness (Marshall). Canlochen (Hanbury). 92. S. Aberdeen : Ben-a-Bourd (Linton). 96. E. Inverness : Glen Markie (Marshall).

Endemic.

22. *HIERACIUM CREMNANTHES* (F. J. Hanbury) Pugsley in Journ. Bot. lxxix. 178 (1941); *H. Marshallii* var. *cremnanthès* Hanb. in Journ. Bot. xxx. 167 (1892); *H. callistophyllum* var. *cremnanthès* Hanb. l. c. xxxii. 226 (1894); Ill. Mon. 65 (1898); in Bab. Man. ed. 9, 240 (1904); Williams, l. c. 122 (1902); W. R. Lint. Brit. Hier. 36 (1905); *H. conspurcatus* subsp. *callistophyllum* var. *cremnanthès* Zahn, l. c. 710 (1921).

Exsicc.—Hanbury, Meal Buidhe, 1889 (type); Linton no. 103 (Glen Falloch); Groves, Stuich-an-lochan, 1891; Linton, Glen Fiagh, 1894; all in Hb. Mus. Brit.

Stem 15–30(–45) cm. high, often slender, with long, spreading, whitish pilose hairs (chiefly below) which become black-based and shorter above, sparingly floccose and with occasional dark glandular hairs upwards. *Radical leaves* usually few, light green; the primordial small, subrotund-oval, rounded-obtuse-mucronulate, denticulate or with a few unequal teeth, shortly contracted below; the later *elliptic-lanceolate to lanceolate*, acute, with *distant*, unequal, *coarse*, spreading or cusped *teeth*, chiefly towards the cuneate base; stem-leaves 1–2, the lower often lanceolate, acuminate, with a few sharp, spreading teeth, subsessile (but sometimes smaller and subentire), the upper small and bractlike; all with *pilose hairs* on both surfaces, with ciliate margins and long-pilose petioles, *glandular hairs apparently wanting*. Inflorescence racemose-corymbose, 1–4-headed, with \pm long, slender peduncles, which are floccose with scattered dark-based pilose and some fine, dark glandular hairs. *Heads large*, rounded below. *Phyllaries* incumbent in bud, *blackish-green*, *broadly linear-lanceolate*, *mostly acute*, scarcely floccose, with numerous, long, dark-based pilose and fewer unequal, dark glandular hairs intermixed. *Ligules* \pm pilose-tipped. *Styles livid*. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 4 mm. long.

This plant was first described by Hanbury, from specimens collected on Meal Buidhe, as a variety of *H. Marshallii* Lint. Two years later, however, he transferred it to the Section *Cerinthoidea* and placed it under his *H. callistophyllum*. The large, dark heads of *H. cremnanthès* recall those of *H. Marshallii* to some extent, but its deeply and irregularly cut foliage is widely different. Its leaves seem almost equally distinct from those of *H. callistophyllum* and its heads are much larger and darker; and it therefore appears to be best treated as a separate species.

Specimens from East Ross (Marshall no. 3438 and Shoolbred no. 716) referred to *H. callistophyllum* var. *cremnanthès* differ from the form originally described in their more ovate-lanceolate, less hirsute and more regularly toothed leaves, and in the lax outer phyllaries of their involucre. It is doubtful whether these plants should be retained under *H. cremnanthès*.

Distribution.—88. Mid Perth : Glen Falloch and Meal Ghaordie (Marshall). Luib (Linton). Stuich-an-lochan (Groves). 90. Forfar : Clova (Linton). 92. S. Aberdeen : Dhuloch (Linton). 97. W. Inverness : Coire Coille (Marshall). 98. Argyll : Meal Buidhe (Hanbury).

Endemic.

23. *HIERACIUM SINUANS* F. J. Hanbury in Journ. Bot. xxx. 167 (1892); Ill. Mon. 55 (1896); in Bab. Man. ed. 9, 238 (1904); Williams, l. c. 107 (1902); W. R. Lint. Brit. Hier. 19 (1905); *H. atratum* subsp. *sinuans* Zahn, l. c. 684 (1921); *H. pulmonarium* Smith, Eng. Bot. no. 2307 (1811)?

Icon.—Hanb. Ill. Mon. pl. 19 ; Eng. Bot. t. 2307, as *H. pulmonarium*.

Exsicc.—Linton no. 30 (Glen Falloch) ; Linton, Corrie Ardran, 1891, and Glen Lyon, 1891 ; all in Hb. Mus. Brit.

Stem 10–40(–50) cm. high, rather slender, very slightly pilose below, a little floccose with a few, scattered, dark pilose and short glandular hairs above. *Radical leaves* bright green, often numerous ; the primordial oval to oblong, obtuse-mucronulate, denticulate, cuneate-based ; the later obovate-oblong to narrowly oblong or lanceolate, obtuse-mucronulate or the innermost acute, denticulate to sinuate-dentate or almost laciniate-dentate with coarse, ascending teeth, attenuate below to normally short and winged petioles ; stem-leaves 1–2, the lower sometimes fairly large, lanceolate, acute, \pm deeply toothed, nearly sessile, the upper small, linear-lanceolate, \pm bractlike ; all *glabrescent* above, with scattered pilose hairs or sometimes glabrescent beneath, with ciliate margins and pilose petioles ; scattered, fine, yellowish glandular hairs also present on the lamina. Inflorescence furcate- or sub-racemose (1–)2–6-headed, with \pm long, flexuous, darkened peduncles, which are sparingly floccose, with many dark glandular and sometimes also a few pilose hairs. *Heads* rather large, rounded below. *Phyllaries* incumbent in bud, *blackish green*, broad, linear-lanceolate, *obtuse* except the innermost, densely clothed with dusky pilose and shorter, unequal, dark glandular hairs. Ligules golden yellow, shortly pilose-tipped. *Styles* *livid*. Margins of receptacle-pits shortly dentate. Achenes blackish, about 3.5 mm. long.

This species is characterized by narrow, glabrate, often deeply sinuate-dentate foliage and deep golden heads with very dark, velvety involucre.

The identity of *H. pulmonarium* Sm. E. B. 2307 is not clear from the description and plate, but the specimen on which it is founded is in Herb. Smith and is certainly *H. sinuans*.

H. olivaceum Gren. and Godr. subsp. *pseudo-langwellense* Zahn in B.E.C. Report, v. ix. pt. v. 559 (1932), founded on material from Loch-an-lairige furnished by G. C. Druce, appears to be identical with *H. sinuans* according to the specimen in Herb. Druce. The specimen is a single plant with two heads, just past flowering, and is scarcely adequate for certain determination.

Distribution.—88. Mid Perth : Glen Falloch (Hanbury). Corrie Ardran, Craig-an-lochan ! and Glen Lyon (Linton). Cam Creag ! Ben Dubh Craige (Groves). 97. W. Inverness : River Nivis (Borrer). 98. Argyll : Ben Chaisteil (Marshall). Ben-a-Chleibh (Shoolbred). 105. W. Ross : Slioch (Salmon). 110. Outer Hebrides : Barra (Somerville).

Endemic.

24. *HIERACIUM SENESCENS* Backhouse, Mon. 32 (1856) : Hanb. Ill. Mon. 44 (1891) ; and in Bab. Man. ed. 9, 237 (1904) ; Williams, l. c. 105 (1902) ; W. R. Lint. Brit. Hier. 17 (1905) ; *H. senescens* subsp. *senescens* Zahn, l. c. 635 (1921) ; *H. atratum* var.—Fries, Epicr. 95 (1862).

Icones.—Eng. Bot. ed. 3, t. 833 ; Hanb. Ill. Mon. pl. 15 (fig. sinistr.) ; Pl. 2, fig. *a*.

Exsicc.—Backhouse, Dhuloch, 1855 ; Linton no. 3 (Fortingal) ; Groves, Ben Laoigh, 1887 ; Shoolbred, Glen Falloch, 1896 ; all in Hb. Mus. Brit.

Stem 15–30(–45) cm. high, clothed with scattered pilose hairs (which are dark-based towards the inflorescence), increasingly floccose upwards, sometimes also with some short, dark glandular hairs. *Radical leaves* bright green, often numerous ; the primordial small, subrotund-oval, rounded-obtuse-mucronulate, denticulate to remotely dentate, abruptly contracted below ; the later *oval* to elliptic-lanceolate, lanceolate or oblanceolate, rounded-obtuse-mucronulate to acute, subentire or

denticulate to coarsely sinuate-dentate, \pm attenuate below to long or short petioles; stem-leaves 1-3, the lowest (often placed low) lanceolate or linear-lanceolate, acuminate, entire or slightly toothed, long-attenuate below, the upper small, \pm bractlike; all *pilose* with \pm stiff hairs above, more softly so beneath, with ciliate margins and long-pilose petioles; the stem-leaves sometimes \pm floccose beneath; glandular hairs on the lamina very few. Inflorescence furcate-corymbose, often with a long branch from the axil of the lowest stem-leaf, (1-)2-5(-6)-headed, the peduncles straight and erect-spreading, usually densely floccose with \pm numerous dark-based pilose and dark glandular hairs in varying proportions. *Heads rather large*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-lanceolate, \pm acute or the innermost finely acuminate, *strongly senescent* (especially in bud), with rather dense dusky or dark-based pilose and \pm numerous, dark, unequal glandular hairs. Ligules golden yellow, finely pilose-tipped or glabrescent. *Styles yellow*. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 4 mm. long.

β . brevifurcatum var. nov.

Icon.—Hanb. Ill. Mon. pl. 15, fig. dextr.

Exsicc.—Pugsley nos. 574 (type) and 575, in Hb. Pugsley; Marshall, Aonach Beg and Fersit Forest, 1896, in Hb. Mus. Brit.

Folium caulinum normaliter 1, saepe parvum. Anthela acladio brevi (5-15 mm.) compacta. Involucra satis angusta; squamae vix senescentes. Aliter ut in typo.

Stem-leaf usually 1, often small. Inflorescence compact, with short acladium. Heads rather narrow; phyllaries scarcely senescent. Otherwise like the type.

H. senescens is a handsome and well-marked species, variable chiefly in its leaf-cutting, that is widely distributed in the Scottish Highlands. The Irish plant referred to it, collected by Waddell in 1900 at Tollymore Park, in the Mourne Mts., Co. Down, appears, as represented in Herb. Hanbury, to be a slender form of the variety *brevifurcatum*. There is a further Irish specimen in the *anglicum* cover in Herb. Hanbury, collected in the Mourne Mts. by Stewart, that has the appearance of a weak example of *H. senescens*.

Distribution.—88. Mid Perth: Ben Lawers, Ben More, Fortingal, etc. (Linton). Am Binnein (Hanbury). Meal Gruaidh! Ben Laoigh! Corrie Ardran! Glen Falloch (Shoolbred). 90. Forfar: Clova! Canlochen! 92. S. Aberdeen: Ben Macdui and Little Craigindal (Linton). Dhuloch (Backhouse). Glen Callater! 94. Banff: Feith am Laoigh (Shoolbred). 97. W. Inverness: Ben Nevis! Aonach Beg and Ben Socaich (Schoolbred). Moidart (Macvicar). 98. Argyll: Meal Buidhe (Hanbury). Meal na Tig-arn (Marshall). 99. Dumbarton: Ben Voirlich (Marshall). var. *brevifurcatum*.

88. Mid Perth: Ben Oss (Groves). Meal Garbh! 97. W. Inverness: Aonach Beg and Fersit Forest (Marshall). Coire Coille! Coire Leis, Ben Nevis!

Ireland.—38. Down: Tollymore Park (Waddell).

Endemic.

25. *HIERACIUM PSEUDANGLICUM* Pugsley in Journ. Bot. lxxix. 178 (1941).

Exsicc.—Linton, Corrie Ardran, 1891, as *H. senescens* (2 sp., type), in Hb. Mus. Brit.; Pugsley nos. 576, 577 and 578, in Hb. Pugsley.

Caulis 25-45 cm., gracilis, flexuosus, basi parvisissime pilosus, vix floccosus, anthelam versus pilis glandulisque obscuris numerosioribus obtectus. Folia radicalia plerumque pauca, pallide virentia, plurima oblonga ad lanceolata (rarius elliptico-lanceolata), obtuso-mucronata ad acuta, obscure denticulata ad leviter sinuato-dentata,

in petiolum \pm longum interdum alatum attenuata; caulina 1-2, inferius saepe magnum, lanceolatum, acuminatum, \pm denticulatum, sessile et inferne parum contractum, superius saepius lineare, acutum, subintegrum; omnia utrinque pilis sparsis vestita vel saepe superne glabrescentia, marginibus ciliatis petiolisque longe pilosis; ut videtur, eglandulosa. Anthela (1-) 2-3 (-6)-cephala, ramis longis suberectis furcato- ad racemoso-corymbosa; pedunculi floccosi glandulis densis obscuris imparibus pilisque obscuris sparsis obtecti. Involucra majuscula angusta, inferne vix rotundata. Squamae in gemmis conniventes, atrovirides, lineari-lanceolatae, longiusculae, angustae, plurimae acutae, extimae laxae, saepe \pm senescentes sed sub-effloccosae, glandulis densis obscuris pilisque longis obscuris immixtis vestitae. Ligulae apice breviter pilosae. Styli leviter lividi. Alveoli receptaculi margine subulato-dentati.

Stem 25-45 cm. high, slender, flexuous, striate, very sparingly pilose below, slightly floccose with increasingly numerous dark-based pilose and dark glandular hairs upwards. Radical leaves generally few, pale green; the primordial small, oval, rounded-obtuse-mucronulate, subdenticulate, shortly contracted below; the later oblong to lanceolate or rarely elliptic-lanceolate, obtuse-mucronate to acute, obscurely denticulate to finely toothed or faintly sinuate, attenuate below to \pm long (sometimes winged) petioles; stem-leaves 1-2, the lower often large, lanceolate, acuminate, denticulate or subentire, sessile and but little contracted below, the upper generally linear, acute, subentire; all with scattered pilose hairs on both surfaces or often glabrescent above, with ciliate margins and long-pilose petioles; fine glandular hairs apparently absent. Inflorescence furcate- or racemose-corymbose, with long, suberect branches, (1-) 2-3 (-6)-headed, the peduncles floccose with dense, unequal, dark glandular and some scattered, dark pilose hairs. Heads rather large, narrow and scarcely rounded below. Phyllaries connivent in bud, blackish green, linear-lanceolate, rather long and narrow, mostly acute, the outermost \pm lax, often \pm senescent but nearly effloccose, with dense, long and short, dark glandular mixed with long, dusky pilose hairs. Ligules shortly pilose-tipped. Styles light livid. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 4 mm. long.

This plant was collected by me in 1929 in three distinct stations in Perthshire and was subsequently identified with exsiccatae obtained in 1891 by Linton in one of the same localities (Corrie Ardran). Linton's material was labelled "*H. senescens*", but a note was attached to it, "This sheet looks queer in silky petioles and cut of leaf". *H. pseudanglicum* appears to be intermediate between *H. senescens* Backh. and *H. anglicum* Fr. The narrow, subentire foliage, with a broadly sessile stem-leaf, and the long-peduncled heads recall forms of the variable *H. anglicum*, but the clothing of the phyllaries rather resembles that of *H. senescens*, and the relatively narrow heads with lax outer phyllaries form a distinctive feature. The material from the different stations is uniform in character, and it seems preferable to treat the plant as a distinct species rather than to regard it as a variety of either of the species to which it seems most nearly allied.

Distribution.—88. Mid Perth: Corrie Ardran! Cam Creag! Craig-na-lochan!

Endemic.

Series **Atrata** (See page 54.)

26. **HIERACIUM GRACILIFOLIUM** (F. J. Hanbury) Pugsley in Journ. Bot. lxxix. 178 (1941); *H. nigrescens* var. *gracilifolium* Hanb. in Journ. Bot. xxx. 166 (1892); and in Bab. Man. ed. 9, 235 (1904); Williams, l. c. 101 (1902); W. R. Lint. Brit. Hier. 19 (1905), pro parte; *H. atratum* Hanb. in Journ. Bot. xxxii. 226 (1894); in Bab. Man. ed. 9, 235 (1904); W. R. Lint. Brit. Hier. 19 (1905), pro parte; non Fries, Symb. 145 (1848); *H. subnigrescens* Norrlin, Bidrag. I. 81 (1888), non Simk. (1881); *H. atratum* subsp. *subnigrescens* var. *gracilifolium* Zahn, l. c. 681 (1921).

Exsicc.—Petrak, Fl. Bohem. 287 a ; Linton no. 78 (Glen Lyon—cult.) ; Linton no. 102 (Glen Falloch, as *H. atratum*) ; Marshall nos. 3493 and 3494 ; all in Hb. Mus. Brit.

Stem (20-)30-40(-50) cm. high, generally slender, with scattered, pale pilose hairs below, becoming floccose upwards with \pm numerous dark glandular and some dark-based pilose hairs. *Raical leaves* bright green, not numerous ; the primordial small, subrotund-oval, rounded-obtuse-mucronulate, subentire or with a few fine teeth, abruptly narrowed below ; the later *oblong* to elliptic-lanceolate or *lanceolate*, rounded-obtuse-mucronate to acute, *denticulate* or with fine, sharp (sometimes irregular and often ascending) teeth, especially towards the subtruncate or \pm cuneate base ; stem-leaf usually 1, lanceolate, acuminate, with sharp, irregular teeth and \pm petiolate, or sometimes smaller, \pm entire and bractlike ; all with \pm numerous, *short, pilose hairs* on both surfaces, with shortly ciliate margins and pilose petioles ; fine, stalked glandular hairs very sparingly present. Inflorescence racemose-corymbose, (1-)2-4(-6)-headed, the suberect peduncles floccose with numerous or even dense, dark glandular hairs. *Heads of medium size*, rounded below. *Phyllaries* porrect in bud ap. W. R. Linton, *blackish green*, linear-oblong, *rather broad* and the outermost somewhat lax, *obtus* except the innermost, almost effloccose, with \pm dense, long and short, dark glandular hairs, normally *epilose*. *Ligules glabrous-tipped*. *Styles yellow or livid*. Margins of receptacle-pits shortly dentate. Achenes blackish, 3-3.5 mm. long.

The British exsiccatae now referred to this species were placed by Hanbury and by W. R. Linton either under *H. atratum* Fr. or *H. nigrescens* Willd. var. *gracilifolium* Hanb. Zahn does not admit the former of these as a British plant, and our specimens so named are not identical with such authentic material as Fries, Hier. Eur. no. 91 (*H. atratum*). The variety *gracilifolium* of *H. nigrescens* cannot be regarded as belonging to *H. nigrescens* Willd., which is allied to *H. Hanburyi*, and it seems inseparable from the plants placed by W. R. Linton under *H. atratum*. It therefore appears best to follow Zahn in treating these British forms as falling under one taxonomic unit, *H. atratum* Fr. subsp. *subnigrescens* (Norrlin) Zahn, and as the distinctive characters of var. *gracilifolium*, as given by British authors and by Zahn, are trivial, to ignore the variety. Our plant would thus be referred, as a species, to *H. subnigrescens* Norrlin. This name is unfortunately antedated by *H. subnigrescens* Simonkai (1881) and so becomes invalid as a later homonym, and it is therefore proposed to substitute Hanbury's *gracilifolium* in a specific sense.

H. gracilifolium is allied to *H. senescens*, and especially to the variety *brevifurcatum*, but it may be distinguished by its slenderer habit, and particularly the absence of senescence and pilose hairs from its more obtuse phyllaries.

Distribution.—88. Mid Perth : Glen Falloch, Corrie Ardran and Glen Lyon (Linton). Ben Lawers (Hanbury). Stuch-an-lochan (Groves). Cam Creag ! Ben More (Marshall). 90. Forfar : Glen Dole (Marshall). 92. S. Aberdeen : Glen Derry (Hanbury). Glen Callater (A. B. Hall). 94. Banff : Loch Builg (Marshall). Glen Avon (Druce). 98. Argyll : Dalmally (Marshall).

General Distribution.—Scandinavia, Central Europe.

27. *HIERACIUM SUBMURORUM* Lindeberg in Blytt, Norg. Fl. ii. 643 (1874) ; Hier. Scand. Exsicc. iii. 112 (1878) ; Hanb. in Journ. Bot. xxx. 134 (1892) ; Ill. Mon. 59 (1896) ; in Bab' Man. ed. 9, 238 (1904) ; Williams, l. c. 143 (1902) ; W. R. Lint. Brit. Hier. 20 (1905) ; *H. atratum* subsp. *submurorum* Zahn, l. c. 677 (1921).

Icon.—Hanb. Ill. Mon. pl. 21.

Exsicc.—Lindbg. H. Sc. iii. 112 ; Fries, H. Eur. no. 91 (as *H. atratum* *subnigrescens*) ; Marshall, Kingshouse, 1888 ; all in Hb. Mus. Brit.

Stem 30–60 cm. high, with spreading, pale pilose hairs about the base, becoming ± floccose upwards with a few scattered, dark-based pilose or glandular hairs. *Radical leaves* light green, generally few; the primordial small, subrotund-obovate, rounded-obtuse-mucronulate, subentire or slightly sinuate-dentate, abruptly contracted below; the later *oval* to elliptic-lanceolate, obtuse-mucronate to acute, *sinuate-dentate* or with a few deep, coarse teeth towards the shortly narrowed or sometimes ± truncate base; stem-leaves 1–2(–3), the lower often lanceolate, acuminate, with irregular, long, sharp teeth, sometimes decurrent on the short petiole, the upper smaller or linear and bractlike; all *pilose* on both surfaces, the margins and the petioles, a few fine, pale glandular hairs also present on the lamina. Inflorescence racemose-corymbose, sometimes with a long lower branch, 3–10-headed, the peduncles floccose with dense, dark glandular and a few dark pilose hairs. *Heads* of *medium* size or rather small, somewhat narrowed below. *Phyllaries* . . . in bud, *blackish green*, linear-lanceolate, mostly *obtus*, ± senescent, *with dense*, dark, unequal *glandular* and *some* longer, dark *pilose hairs* intermixed. Ligules slightly pilose-tipped, but flowers sometimes stylose. *Styles livid*. Margins of receptacle-pits not known. Achenes reddish-black, about 3.5 mm. long.

H. submurorum is a somewhat doubtful British species. The original Scottish specimens, collected by Marshall at Clach Leathad, Kingshouse, Argyll, in 1888, were submitted in 1890 to Lindeberg, who commented on them, 'Proximum *Hiero. submurorum*. Cf. Hier. Scand. Exsicc. no. 112'. On this authority the Kingshouse plant was identified with *H. submurorum* Lindbg., and described and figured as such in Hanbury's Monograph. The Kingshouse exsiccatae, now in Herb. Mus. Brit., certainly resemble the Scandinavian examples, but differ to some extent in their smaller and narrower heads with ligulate and not stylose florets. The specimens examined from Stob Ban, etc. differ from the Kingshouse plant and do not seem referable to *H. submurorum*.

Distribution.—98. Argyll: Kingshouse (Marshall).

General Distribution.—Norway, in the Alpine and Arctic regions.

28. *HIERACIUM CUMBRIENSE* F. J. Hanbury in Journ. Bot. xxxi. 17 (1893), and xxxii. 226 (1894); W. R. Lint. Brit. Hier. 20 (1905), ex parte; *H. atratum* subsp. *cumbriense* Zahn, l. c. 682 (1921), ex parte.

Exsicc.—H. E. Fox, Dollywaggon, 1890; Dove Craggs, Fairfield, 1890; both in Hb. Hanbury.

Stem 30–40 cm. high, rather slender, striate, nearly glabrous below but slightly floccose with scattered fine, dark pilose and glandular hairs above. *Radical leaves* pale green; the primordial, when produced, small, subrotund-oval, rounded-obtuse-apiculate, subentire and subtruncate below; the later *elliptic* to elliptic-lanceolate, obtuse-mucronate to acuminate, *with distant, fine, apiculate teeth*, of which the lower may be spreading or deflexed, or the innermost leaf sometimes with a few coarse, sharp, basal teeth becoming decurrent on the petiole, the base varying from subtruncate to cuncate; stem-leaf 1, ovate-lanceolate, finely acuminate, subentire, subpetiolate; all *with scattered pilose hairs* on both surfaces or glabrescent above, margins shortly ciliate and petioles ± villous; glandular hairs apparently absent. Inflorescence racemose-corymbose, 3–7-headed, with straight, erect-spreading branches exceeding the accladium, the peduncles sparingly floccose with numerous fine, dark glandular and pilose hairs. *Heads of medium* size, rather narrow and scarcely rounded below. *Phyllaries porrect* in bud, *blackish green*, elongate, linear-lanceolate, mostly *subacute*, *with dense, dark, unequal* but generally *fine glandular hairs* interspersed with numerous *longer, dark pilose hairs*, scarcely floccose. *Ligules glabrous-tipped*. *Styles livid*. *Margins of receptacle-pits dentate-fimbriate*. Achenes reddish-black, 3.5–3.75 mm. long.

This rare plant was briefly described without a name by Hanbury in 1893 (l. c.) from specimens collected in 1890 by H. E. Fox at Dollywaggon Pikes, in Cumberland, and in the following year, after it had been shown to Elfstrand, who considered it a good species not known in Scandinavia, it was named *H. cumbriense* F. J. Hanb. Although it was not mentioned by Hanbury, other similar specimens were sent to him by Fox collected in the same year (1890) at Dove Craggs, Fairfield, in Westmorland. In his Monograph, which covers this group, and later, in his account of the genus in Babington's Manual, ed. 9, *H. cumbriense* is unnoticed by Hanbury, perhaps because he thought his material insufficient to warrant its insertion. W. R. Linton, in his 'British Hieracia', includes *H. cumbriense* and identifies with it another plant discovered by Rev. H. J. Riddelsdell in 1903 at Barras, in Westmorland; and his description seems largely based on the Barras material. Zahn's account is evidently taken from W. R. Linton's.

The Barras form, while approaching the original *H. cumbriense* in its foliage, is distinctly different in its inflorescence and head-clothing, and is here treated as a species of the Section *Vulgata*, Subsection *Glandulosa*. The true *H. cumbriense*, which I vainly searched for at Dollywaggon in 1927, seems never to have been refound in the original stations, but the specimens in Herb. Hanbury are good ones, showing sufficiently the plant's characters. A specimen collected by A. Wilson in Red Gill, Cumberland, appears to be conspecific, as does another, found by Fox in Pier's Gill, Scafell, and referred in Herb. Hanbury to *H. ciliatum* Almq. The apparently dentate-fimbriate alveoles seem to indicate an affinity with *H. anglicum*.

Distribution.—69. Westmorland: Dove Craggs (Fox). 70. Cumberland: Dollywaggon (Fox). Red Gill (Wilson). Scafell (Fox).

Endemic.

29. *HIERACIUM CENTRIPETALE* F. J. Hanbury in Journ. Bot. xxx. 166 (1892); Ill. Mon. 57 (1896); in Bab. Man. ed. 9. 238 (1904); Williams, l. c. 129 (1902); W. R. Lint. Brit. Hier. 21 (1905); *H. atratum* subsp. *centripetale* Zahn, l. c. 680 (1921).

Icon.—Hanb. Ill. Mon. pl. 20.

Exsicc.—Linton no. 6 (Moffat); Linton, Moffat, 1890; Marshall no. 912; ali in Hb. Mus. Brit.

Stem 20–40(–50) cm. high, with scattered, whitish pilose hairs below, and short, dark-based pilose hairs (with a few short glandular) above. *Radical leaves spreading* in a rosette, light green; the primordial small, oval, rounded-obtuse-mucronulate, denticulate, abruptly narrowed below; the later elliptic to *elliptic-lanceolate* or lanceolate, acute to acuminate, *with many sharp, ±spreading teeth* often with intermediate denticulations, attenuate below (less so in some Scottish specimens) to rather short petioles; stem-leaf 0 or 1, often placed low, lanceolate, acuminate, sharply toothed and petiolate, or smaller and ±bractlike; all *softly pilose* on both surfaces or glabrescent above, with shortly ciliate margins and villous petioles; glandular hairs apparently wanting. Inflorescence racemose- or furcate-corymbose, sometimes with a long lower branch, 3–15-headed, with slender, arcuate peduncles, which are floccose with dense, dark glandular and fewer dusky pilose hairs. *Heads of medium size, narrowed below*. *Phyllaries* (porrect) in bud, *blackish green, narrow*, nearly linear, *elongate and acute, with dense, dark glandular and many longer, dusky pilose hairs, scarcely floccose*. *Ligules usually strongly pilose-tipped*. *Styles levid*. Margins of receptacle-pits incise-dentate ap. W. R. Linton. Achenes reddish black, about 3.5 mm. long.

This species is placed both by Hanbury and W. R. Linton among the *Nigrescentia*, and this treatment is followed by Zahn. Williams (l. c.) locates it among his *Vulgata*, and a specimen from Glen Derry in Herb. Hanbury was referred to

"*H. anglicum* var." by Elfstrand. The densely glandular and rather narrow heads of *H. centripetale* recall the species of the Subsection *Glandulosa* of the Section *Vulgata*, but the inflorescence seems to be of the racemose type which generally characterizes the *Subalpina*, and the plant is therefore retained in this group. The occurrence of glandular hairs on the foliage is doubtful.

The description and plate in Hanbury's Monograph are taken from Moffat specimens, and the majority of the exsiccatae seen in herbaria were obtained in this district.

Distribution.—72. Dumfries : Moffat (Linton). 86. Stirling : Glengyle (Kidston). 92. S. Aberdeen : Glen Derry (Hanbury). 96. E. Inverness : Glen More (Druce). 97. W. Inverness : Loch Laggan (Hanbury). 100. Clyde Is. : Glen Sannox, Arran (Ley).

Endemic.

Series **Hyparctica** (See page 54.)

30. *HIERACIUM HYPARCTICOIDES* Pugsley in Journ. Bot. lxxix. 179 (1941).

H. hyparcticum Hanb. in Journ. Bot. xxxii. 226 (1894) ; Ill. Mon. 62 (1898) ; in Bab. Man. ed. 9, 239 (1904) ; Williams, l. c. 108 (1902) ; W. R. Lint. Brit. Hier. 21 (1905) ; non Alm. ex Elfstr. Hier. Alp. 50 (1893) ; nec *H. nigrescens* subsp. *hyparcticum* Alm. in Overs. K. Vet. Akad. Förh. xli. no. 7, 46 (1884) ; nec *H. atratum* subsp. *hyparcticum* Zahn, l. c. 687 (1921).

Icon.—Hanb. Ill. Mon. pl. 22.

Exsicc.—Hanbury, Inchnadamph, 1890 (type), in Hb. Hanbury ; Marshall nos. 3267 and 3268 (partim) ; R. F. Thompson, cult. 1895 ; all in Herb. Mus. Brit. ; Pugsley no. 579, in Hb. Pugsley.

Stem 20–45 cm. high, slender, with scattered pilose hairs (dark-based towards the inflorescence), also slightly floccose and with a few dark glandular hairs above. *Radical leaves* few, yellowish green ; the primordial obovate, rounded-obtusely mucronulate, finely denticulate, shortly cuneate-based ; the later *oblong* to lanceolate or elliptic-lanceolate, apiculate to acute, finely *denticulate* or with a few, small, sharp spreading teeth towards the shortly cuneate base ; stem-leaves 1–2, the lower, if two are produced, lanceolate, acuminate, with distant, fine, sharp teeth, narrowed below to a winged petiole, the upper linear-lanceolate or linear, acute, subentire, sessile ; all *with scattered pilose hairs* on both surfaces or glabrescent above, also \pm densely *floccose beneath*, with ciliate margins and pilose (often long) petioles ; *glandular hairs apparently absent from the lamina*. Inflorescence racemose-corymbose, 2–3(–7)-headed, with \pm long, erect-spreading peduncles, which are floccose with numerous fine, dark glandular and a few dark-based pilose hairs. *Heads of medium size, obconic and attenuate below*. *Phyllaries porrect in bud, blackish green*, outermost broad, lanceolate and obtuse, the inner lanceolate-subulate and \pm acute, floccose, especially on the margins, senescent, *with numerous, fine, unequal, dark glandular hairs and some longer, blackish pilose hairs intermixed*. *Ligules pilose-tipped*. *Styles fuscous*. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3.5–4 mm. long.

H. hyparcticum was originally described by Almquist (l. c.) from Greenland material, and specimens of the British plant, found near Inchnadamph, in West Sutherland, and forwarded by Hanbury, were referred to it by Elfstrand, who thought (vide Hanb. Ill. Mon. 62) it constituted a distinct variety, differing from the typical species by its more entire leaves and its larger involucre, with longer, narrower phyllaries and shorter glandular hairs. A tentative varietal name was suggested by Hanbury (l. c.). Williams and W. R. Linton did not distinguish this British plant

from the typical *H. hyparcticum*, and Zahn, who does not appear to have seen any specimens, cites Inchnadamph as a British station without comment.

There is a Greenland example in Herb. Kew (*H. nigrescens* Willd.* *hyparcticum* Alm. Groenlandia orientalis. Kung Oskewhavn. Coll. Aug. Aerlin. 5. ix. 83) which shows sufficiently the original plant's essential features, and agrees with the brief descriptions of Almquist and Elfstrand. Its leaves are acute and sharply toothed with long petioles, and are not floccose beneath; the heads are cuneate-based as in the British plant, but, like the peduncles, are more densely and strongly glandular. The phyllaries are acute and porrect. These features are better seen in the recent Greenland material obtained by Dr. Polunin. The leaves of the Inchnadamph form are less toothed and densely floccose beneath, and its heads are blacker with distinctly shorter glandular hairs, resembling somewhat those of *H. curvatum* Elfstr. As the foliar and floral differences in the two plants are thus considerable, it seems desirable to separate the Inchnadamph plant as a distinct species, *H. hyparcticoides*, placing it tentatively in the same group. It has not yet been found in any further localities.

The specimens sent out by Marshall under the number 3268 from the classic station near Inchnadamph are a mixture of the true plant with examples of a widely different form resembling *H. killinense* (Zahn).

Distribution.—108. W. Sutherland : Inchnadamph (Hanbury and Marshall).

Endemic.

31. *HIERACIUM ISABELLAE* E. S. Marshall in Journ. Bot. li. 119 (1913).

Exsicc.—Marshall nos. 3613 and 3616; Shoolbred nos. 751, 770, 781 and 783; all in Hb. Mus. Brit.

Stem 25–45 cm. high, slender or flexuous, sparingly pilose and floccose throughout. *Radical leaves* few, green or occasionally tinted with purplish; the primordial broadly elliptic, obtuse-mucronate, with a few short, ascending teeth, shortly cuneate-based; the later lanceolate or *elliptic-lanceolate*, acute to acuminate, denticulate to *sharply* (and sometimes coarsely) *dentate* with ascending teeth, long attenuate below to long or short petioles; stem-leaves 1–2, the lower generally large, lanceolate, acuminate, with ascending teeth, long attenuate below but often sessile, the upper small, linear-lanceolate or linear, with a few teeth or subentire, sessile; all with *pilose hairs* on both surfaces, with a few, scattered, fine glandular hairs intermixed, the margins ciliate and petioles pilose. Inflorescence racemose-corymbose, 2–6-headed, with rather long, slender, bracteolate peduncles, which are floccose with spreading pilose and often numerous, fine glandular hairs. *Heads of medium size*, narrowed below and subtended by \pm spreading bracteoles. *Phyllaries* . . . in bud, *olive-green*, linear-lanceolate, mostly *obtuse*, sparingly floccose below, with many pale, dark-based *pilose hairs* intermixed with numerous short, fine glandular hairs. *Ligules glabrous-tipped*. *Styles livid*. *Margins of receptacle-pits* \pm fimbriate-dentate. Achenes blackish, about 4 mm. long.

H. Isabellae, discovered by Marshall in various stations near Dalwhinnie, and more recently collected by myself near Ben Chlinaig, in West Inverness-shire, is a well-marked plant that recalls *H. hyparcticoides* through its turbinate heads. In leaf-cutting and the clothing of the phyllaries, however, it is widely different, and may be held to constitute a well-marked species.

Distribution.—89. E. Perth : near Dalnaspidal (Marshall). 96. E. Inverness : Ben Alder (Marshall). 97. W. Inverness : Ben Chlinaig !

Endemic.

Series **Callistophylla**. (See page 54.)

32. *HIERACIUM CALLISTOPHYLLUM* F. J. Hanbury in Journ. Bot. xxx. 168 (1892) ; Ill. Mon. 64 (1898) ; in Bab. Man. ed. 9, 239 (1904) ; Williams, l. c. 121 (1902) ; W. R. Lint. Brit. Hier. 36 (1905) ; *H. conspurcans* subsp. *callistophyllum* Zahn, l. c. 709 (1921).

Icon.—Hanb. Ill. Mon. pl. 23.

Exsicc.—Hanbury, Clach Leathad and Kingshouse, 1889 ; Linton no. 56 (Glen Spean) ; all in Hb. Mus. Brit.

Stem 20–40(–60) cm. high, generally rather slender, with scattered pilose hairs which are black-based above, \pm floccose and with occasional dark glandular hairs upwards. *Radical leaves* (often numerous) light green ; the primordial obovate to oval, rounded-obtuse-mucronulate, subentire in the upper half with \pm spreading teeth towards the cuneate or abruptly contracted base ; the later obovate to oval or lanceolate, rounded-obtuse like the primordial to acute, with sharp, \pm spreading, unequal teeth, especially towards the \pm cuneate base ; stem-leaf 0 or 1, lanceolate, acuminate, sharply toothed and subpetiolate or smaller and bractlike ; all with rough pilose hairs on both surfaces or glabrescent above, with ciliate margins and pilose petioles ; glandular hairs apparently absent. Inflorescence (1–)2–6-headed, with erect-spreading peduncles, which are floccose with \pm dense, dark-based pilose and sometimes dark glandular hairs. Heads of medium size, radiant, rounded below. *Phyllaries* incumbent in bud, blackish or olive-green, linear-lanceolate, obtuse, floccose (chiefly along the margins and towards the base), strongly senescent, with dense, long, whitish, dark-based pilose hairs and a few fine glandular hairs intermixed. Ligules glabrous-tipped. Styles yellow to light livid. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 3.5 mm. long.

H. callistophyllum, as its name implies, is a plant with handsome foliage, and under cultivation it can become very luxuriant.

The specimens referred to var. *glandulosum* Hanb. Ill. Mon. 66, that have been examined (Salmon, Ben Nevis and Coire-a-Chearcaill, 1902) seem to differ from the typical form only in the more numerous glandular hairs on their peduncles and phyllaries, and seem doubtfully separable as a variety. Hanbury's variety *cremnanthus* has been separated as a distinct species allied to *H. Marshallii* Lint.

Distribution.—88. Mid Perth : Ben Laoigh ! Corrie Ardran ! Meal Ghaordie (Groves). 97. W. Inverness : Glen Spean (Marshall). Coire Leis, Ben Nevis ! 98. Argyll : Clach Leathad (Hanbury). Kingshouse and Black Mt. (Marshall).

Endemic.

33. *HIERACIUM DASYTHRIX* (Linton) Pugsley in Journ. Bot. lxxix. 179 (1941) ; *H. pictorum* var. *dasythrix* Lint. in Journ. Bot. xxxi. 178 (1893) ; Williams, l. c. 130 (1902) ; Hanb. in Bab. Man. ed. 9, 251 (1904) ; *H. rivale* var. *dasythrix* W. R. Lint. Brit. Hier. 51 (1905) ; *H. sagittatum* subsp. *rivale* var. *dasythrix* Zahn, l. c. 349 (1921).

Exsicc.—Linton no. 111 (Corrie Ardran) (type) ; Marshall nos. 1766, 3505, 3509 and 4007 ; all in Hb. Mus. Brit.

Stem 25–40 cm. high, slender, striate, with pilose hairs below, becoming floccose above with \pm numerous, spreading, dark-based pilose hairs. *Radical leaves* few, deep green, paler beneath, strongly nerved ; the primordial small, oval, rounded-obtuse-mucronulate, denticulate, rounded below ; the later ovate to elliptic-lanceolate, obtuse-mucronate to acute, denticulate or with a few very shallow teeth towards the rounded or shortly cuneate base ; stem-leaf normally 1, suberect, elliptic to linear-lanceolate, acuminate, with a few small teeth below or subentire, often attenuate below but sessile ; all \pm pilose on both surfaces (the stem-leaf also \pm floccose

beneath) with ciliate margins and villous petioles; *glandular hairs apparently wanting*. Inflorescence racemose-corymbose, often with a short branch from the axil of the stem-leaf, 2-7-headed, with rather long peduncles, which are floccose with \pm numerous, long, spreading, dark-based pilose and shorter glandular hairs. *Heads of medium size, broad, rounded below*. *Phyllaries* porrect in bud ap. W. R. Linton, *dark green* (the inner with paler margins), short and *broad, linear-oblong, obtuse, sparingly floccose, with dense, long, dark-based pilose hairs* intermixed with a few shorter glandular hairs. *Ligules* orange-yellow, *nearly glabrous-tipped*. *Styles yellow*. Margins of receptacle-pits incise-dentate. Achenes nearly black, about 3.5 mm. long, with white pappus

This plant was first described as a variety of *H. pictorum* Lint. but was transferred in 1905 by W. R. Linton to *H. rivale* Hanb., another species of the group *Vulgata*. The inflorescence, however, is of the racemose-corymbose form characteristic of the Section *Subalpina*, and the form and clothing of its heads very much resemble those of *H. callistophyllum*. It is therefore treated as a member of the *Subalpina*, although, like *H. callistophyllum*, it does not possess the features of the group in a very marked degree.

Distribution.—88. Mid Perth: Corrie Ardran and Luib (Linton). Am Binnein (Hanbury). 97. W. Inverness: Coire Coille! Moidart (Macvicar). 98. Argyll: Clach Leathad (Hanbury). Ben Odhar (Groves). Dalnally and Ben Laoigh (Marshall). Kingshouse (Shoolbred).

Endemic.

Sect. IV. CERINTHOIDEA.

Fries, *Epier.* 56 (1862); W. R. Lint. *Brit. Hier.* 2 and 10 (1905); *Cerinthoidea-Vulgata* Zahn, l. c. 166 (1921).

Scapigerous or cauligerous plants of normally robust growth (less so in *H. ebudicum*, *H. flocculosum* and *H. Shoolbredii*), with glaucous or glaucescent foliage (except *H. languellense*) and cauline leaves frequently semi-amplexicaul. Rhizome not woolly. Stem and leaves (eglandular) usually clothed with long, denticulate pilose hairs. Inflorescence racemose- or sub-corymbose, often with long peduncles. Heads \pm large, with normally light yellow florets (excepting *H. hebridense*, *H. petrocharis*, *H. iricum* and *H. scarpicum*) and densely pilose phyllaries (less so in *H. hebridense* and *H. Shoolbredii*) which are generally incumbent in bud. Ligules pilose-tipped (only partially so in *H. petrocharis* and *H. flocculosum*). Styles livid (except in *H. brigitum*, *H. ebudicum* and a variety of *H. flocculosum*). Margins of receptacle-pits dentate and \pm fimbriate.

Flowering June-July.

The species of this Section inhabit chiefly France and the Pyrenees, and seem to be unknown in Scandinavia. In Ostenfeld and Grøntved's recent 'Flora of Iceland and the Faeroes' ten species are given for the Faeroes, eight of which were described by Dahlstedt, and two species are included from Iceland. No material of these boreal species has been examined. In Britain all of the species of the *Cerinthoidea* are apparently endemic. They grow most generally in Scotland, extending northwards to the Orkneys and the Outer Hebrides but not to the Shetlands. They are also frequent in the north of England as far southwards as Yorkshire, but are unknown in Wales. Two species are scattered over almost the whole of Ireland and two others occur there locally. Three new species from the Outer Hebrides are here described, which are of special interest in view of the number of species now known to grow in the Faeroes.

In wild habitats the British forms of the *Cerinthoidea*, unless stylose-flowered, are handsome plants with fine foliage and large, conspicuous heads of flowers, often borne on long, arching peduncles. In cultivation, however, they largely tend to a coarse habit of growth, with more numerous but much less beautiful heads. They grow naturally in a great variety of situations, from sea-cliffs and rocky river-banks to high mountain ledges.

Series *Anglica* [Grex *H. anglicum* Fr.].

Scapigerous plants, with (0-)1-2(-4) stem-leaves. Inflorescence \pm lax, racemose-corymbose, with 1 or few heads. Ligules generally light yellow.

* Leaves pilose or setose, normally effloccose.

Leaves pilose, rarely floccose beneath, \pm cuneate-based. Peduncles long, arching. Phyllaries densely long-pilose	<i>H. anglicum</i> .
Leaves setose above, subtruncate-based. Peduncles long. Phyllaries densely long-pilose. Styles yellow	<i>H. briganium</i> .
Leaves subsetose above, \pm truncate-based. Peduncles shorter. Phyllaries less pilose and more glandular, porrect in bud. Styles yellow.....	<i>H. ebudicum</i> .
Leaves pilose, subcuneate-based. Peduncles shorter. Phyllaries less pilose. Ligules full yellow	<i>H. hebridense</i> .
Leaves pilose, subtruncate-based. Peduncles shorter. Phyllaries more shortly pilose. Florets often stylose	<i>H. ampliatum</i> .
Leaves pilose, shortly cuneate-based. Peduncles long. Phyllaries densely pilose. Ligules full yellow, partially pilose-tipped	<i>H. petrocharis</i> .
Leaves pilose, long, cuneate-based, not glaucous. Peduncles long. Phyllaries less pilose. Ligules full yellow	<i>H. langwellense</i> .

** Leaves less pilose, \pm floccose.

Leaves floccose on both surfaces or at least below. Peduncles long, arching. Phyllaries pilose	<i>H. flocculosum</i> .
Leaves broader, floccose beneath only. Peduncles slender and erect. Phyllaries more shortly pilose, porrect in bud. Plant dwarfer and more slender.....	<i>H. Shoolbredii</i> .

Series *Irica* [Grex *H. iricum* Fr.].

Cauligerous plants, with 3-several stem-leaves. Inflorescence subcorymbose with 1-20 heads. Ligules full yellow.

Stem tall and robust, with 3-6 (-9), mostly semi-amplexicaul stem-leaves. Inflorescence with 1-16 (-20) broad heads	<i>H. iricum</i> .
Stem dwarfer and less robust, with (2-) 3-4 large, coarsely toothed stem-leaves (subpetiolate except the uppermost). Inflorescence with 2-6 narrower heads	<i>H. scarpicum</i> .

Series *Anglica* (See above.)

34. *HIERACIUM ANGLICUM* Fries, Symb. 93 (1948); Epicr. 57 (1862), excl. loc. pyrenaeis; Hanb. Ill. Mon. 68 (1898); in Bab. Man. ed. 9, 240 (1904); Williams, l. c. 93 (1902); W. R. Lint. Brit. Hier. 10 (1905); *H. cerinthoides* β *anglicum* Backh. Mon. 36 (1856); *H. Mougeotii* subsp. *anglicum* Zahn, l. c. 186 (1921); *H. patens* Dahlst. in Johnston, Add. Fl. Orkney, xvii. 5-7, in Trans. Bot. Soc. Edin. (1934).

Icones.—Eng. Bot. ed. 3, t. 836; Hanb. Ill. Mon. pl. 24; Zahn, l. c. fig. 17; Pl. 2, fig. b.

Exsicc.—Stewart, Belfast, 1882; W. R. Linton, Ward Hill, Hoy, Orkney, 1886; Groves, Ben Laoigh, 1887; Wilmott no. 1155 b; all in Hb. Mus. Brit.

Stem (10-)20-30(-50) cm. high, robust, pilose or subglabrous. *Radical leaves* normally thin, glaucous; the primordial rotundate, apiculate, shortly narrowed below; the later large, *ovate* to *ovate-lanceolate*, acute to acuminate, typically *dentate towards the base* but more often *denticulate or subentire, attenuate below* to

rather long petioles; *stem-leaves usually 2*, the lower oval, little toothed, \pm acuminate, generally narrowed below but semi-amplexicaul, the upper small, \pm linear and bractlike (in weak plants often 1 bractlike leaf only); all *pilose* on both surfaces (especially beneath), margins and still more on petioles with long, waved, denticulate hairs, rarely also \pm floccose beneath. *Inflorescence* racemose-corymbose, with 1-4(-8, cult.) heads, when branched, *with long arcuate-ascending peduncles*, which are floccose with \pm numerous dark-based pilose and dark glandular hairs. Heads large and handsome, ventricose or rounded below. *Phyllaries* incumbent in bud, *dark grey-green*, numerous, elongate (except the outer), linear-lanceolate, acuminate, sparingly floccose, \pm senescent, *densely clothed with long, black-based pilose hairs* with fewer or no glandular hairs intermixed. Ligules normally light yellow, pilose-tipped. Styles livid. Margins of receptacle-pits dentate-fimbriate. Achenes reddish black, 3.5-4 mm. long.

β . acutifolium (Backh.) Bab. Man. ed. 5, 203 (1862); Williams, l. c. 93 (1902); Hanb. in Bab. Man. ed. 9, 240 (1904); W. R. Lint. Brit. Hier. 11 (1905); *H. cerinthoides* γ . *acutifolium* Backh. Mon. 37 (1856); *H. Mougeotii* subsp. *anglicum* f. *acutifolium* Zahn, l. c. 186 (1921).

Exsicc.—Backhouse, Cairntoul, 1855; Linton no. 58; W. R. Linton, Braemar, 1889; Linton, Sneasdal, Skye, 1888; all in Hb. Mus. Brit.

Radical leaves generally glabrescent above, oblong-lanceolate, very acute, with coarse, sharp teeth sometimes descending the petiole; lower stem-leaf sometimes sharply toothed. Heads 1-5, more shortly pedunculate than in the type.

γ . amplexicaule Backh. ex Bab. Man. ed. 5, 203 (1862); Williams, l. c. 94 (1902); *H. anglicum* var. *decipiens* Syme, Eng. Bot. ed. 3, v. 180 (1866); *H. anglicum* var. *cerinthiforme* Hanb. in Bab. Man. ed. 9, 240 (1904); W. R. Lint. Brit. Hier. 11 (1905); *H. Lawsonii* Sm. Eng. Bot. no. 2083 (1809), non Vill.; *H. cerinthoides* α Backh. Mon. 36 (1856); *H. cerinthiforme* Hanb. in Journ. Bot. xxx. 169 (1892); *H. Mougeotii* subsp. *anglicum* var. *cerinthiforme* Zahn, l. c. 186 (1921).

Exsicc.—Backhouse, Loch Lee and Glen Callater, 1855; Linton no. 80 (Coire Coille); Croall, Glen Callater, 1854; Marshall nos. 3053, 3290 and 3307; Linton, Mt. Brandon, 1885; all in Hb. Mus. Brit.

Radical leaves few, broadly oval to lanceolate, subentire or with shallow teeth chiefly about the middle of the lamina; stem-leaves 2-4, the lower oblong, acuminate, sometimes sharply toothed, typically narrowed below but with an amplexicaul base, more rarely contracted to a long, winged petiole, the uppermost small and bractlike. Heads 1-7.

δ . Hartii (Hanb.) Williams, l. c. 95 (1902); Hanb. in Bab. Man. ed. 9, 240 (1904); *H. cerinthiforme* var. *Hartii* Hanb. in Journ. Bot. xxx. 169 (1892); *H. anglicum* var. *cerinthiforme* f. *Hartii* W. R. Lint. Brit. Hier. 11 (1905); *H. Mougeotii* subsp. *anglicum* var. *cerinthiforme* f. *Hartii* Zahn, l. c. 186 (1921).

Exsicc.—Linton, Ben Bulbin, 1885; Hanbury, Slieve League, 1891 (in Hb. Barton as var. *cerinthiforme*); both in Hb. Mus. Brit.

Radical leaves \pm obovate, withering early. Stem-leaves 3-5, large, ovate to obovate, amplexicaul. Phyllaries broad, green, subobtus.

H. anglicum is a widely distributed and very variable species, but generally to be recognized without much difficulty by its robust habit, large, glaucous and cuneate-based foliage and long, arching peduncles bearing large, lemon-yellow heads with pilose-tipped ligules and livid styles. Dwarf forms of the Scottish hills sometimes resemble species of the *Subalpina*, and the species was, indeed, placed by Backhouse among his *Alpina-Nigrescentia*. Old, vigorous plants sometimes become much branched and have been confused with *H. iricum* Fr. In the west of Ireland remarkably luxuriant forms occur, of low stature, with large, spreading leaves and

heads of the largest size. These forms seem referable sometimes to the typical species, as in County Clare, sometimes to var. *acutifolium*, as at Glenade, in Sligo; and on Ross Island, near Killarney, a similarly luxuriant state of var. *amplexicaule* formerly grew. There are other Irish forms, with more deeply coloured flowers, that perhaps should be distinguished. A conspicuously narrow-leaved form of var. *amplexicaule* resembling that depicted in E.B. 2378 (as *H. cerinthoides*) grows in the Outer Hebrides and also at Inchnadamph. Intermediate forms connecting the varieties *acutifolium* and *amplexicaule* with each other and with the typical species may occasionally be met with. A specimen in Herb. Backhouse, collected on Cairntoul in 1852, has dentate and scarcely petiolate radical leaves and may belong to a distinct species. The sheets seen of Linton no. 57, issued as *H. anglicum*, show plants with much toothed leaves and are scarcely typical. The Pyrenean *H. anglicum*, as represented by the exsiccatae Sudre nos. 219–221, is widely different from the British plant. Its heads are much smaller, and it has the aspect of a species of the *Vulgata-Glandulosa* group. Although treated as *H. anglicum* by Rouy (Fl. Fr. ix. 312), it is not admitted by Zahn as identical with Fries's species. *H. subimpressum* Dahlst. in B.E.C. Report, viii, pt. 1, p. 29 (1927), is described from a fragmentary example of *H. anglicum* in Herb. Druce.

The type specimens of *H. patens* Dahlst. (Johnston nos. 4741 and 4742) in Johnston's 'Additions to the Flora of Orkney', xvii, pp. 5–7 (1934), collected on the island of Hoy, are rather large and luxuriant plants of *H. anglicum* Fr., which seem inseparable from the typical form.

In cultivation, at least in heavy soils, *H. anglicum*, whether of English, Scottish or Irish origin, becomes much modified. The rootstock soon branches very considerably and sends up a number of flowering stems, each of which develops two or three relatively small heads, quite lackin: the handsome aspect of the wild plant.

H. anglicum was first described as *H. leptocaulon hirsutum folio longiore* D. Lawson in Ray's Synopsis, ed. 2, 74 (1696), from Anna Well, Westmorland, where, it is believed, it still exists. It was figured by Petiver (Cat. pl. xiii. f. 3 (1713)).

Distribution.—64. M.W. Yorks: Stainforth (R. F. Thompson). Kettlewell! Heseldon Glen! 65. N.W. Yorks: Upper Teesdale! 66. Durham: Winch Bridge! 69. Westmorland: Stybarrow (Ridley). Dove Craggs (Fox). 70. Cumberland: Dollywaggon! Scafell (Fox). Crow Dundle (Wilmott). 88. Mid Perth: Glen Falloch! Killin! Cam Creag! Craig-na-lochan! Ben Lawers! Ben Laoigh (Groves). 89. E. Perth: Ben Vrackie! Killikrankie (A. B. Hall). Glen Shee (Linton). Dalnaspidal (Riddelsdell). 90. Forfar: Clova! 92. S. Aberdeen: Braemar! 94. Banff: Bridge of Aan (Roffey). 96. E. Inverness: Glen Eunach (Groves). 97. W. Inverness: Fersit (Linton). 98. Argyll: Ben Chaisteil (Groves). 102. S. Ebudes: Colonsay (McNeill). 104. N. Ebudes: Sneasdal and Cuchullins, Skye (Linton). 105. W. Ross: Loch Carron (Druce). 106. E. Ross: Glas Carnoch (Shoolbred). 108. W. Sutherland: Inchnadamph (Hanbury). 110. Outer Hebrides: Barra (Somerville). 111. Orkney: Hoy (Linton).

Ireland.—2. N. Kerry: Killarney (Woods). Mangerton (Ridley). Paps Mt. (Scully). 6. Waterford: Comeraghs (Hart). 7. S. Tipperary: Galtees (Hart). 9. Clare: Ballyvaughan! 15. S.E. Galway: Garryland (Praeger). 16. W. Galway: Muckanaght (Hart). Clonbar (Marshall). 26. E. Mayo: Lough Mask (Praeger). 27. W. Mayo: Westport (Browning). Croaghpatrick (Hart). Clare I. (Praeger). 28. Sligo: Glencar (Hanbury). 29. Leitrim: Lough Gill (Praeger). 31. Louth: Carlingford (Praeger). 33. Fermanagh: Poulaphuca and Carrickgower (Praeger). 35. W. Donegal: Fanet (Hart). 38. Down: Mourne Mts. (Praeger). 39. Antrim: Belfast and Sallagh Braes (Stewart). Knock Dhu! 40. Londonderry: Benevenagh (Waddell).

var. *acutifolium*.

65. N.W. Yorks: Swaledale (Foggitt). Sedbergh (Wilson). 70. Cumberland: Cross Fell (Wilmott). 88. Mid Perth: Glen Lochay (Marshall). 89. E. Perth:

Dalwhinnie (Marshall). 90. Forfar : Glen Dole (Burkill). 92. S. Aberdeen : Cairntoul (Backhouse). Braemar! 94. Banff : Tomintoul (Marshall). 96. E. Inverness : Glen Eunach (Groves). 97. W. Inverness : Aonach Mor (Linton). 98. Argyll : Meal Buidhe (Hanbury). Dalmally (Marshall). 104. N. Ebudes : Sneasdal, Skye (Linton). Rnum (K. B. Blackburn). 105. W. Ross : Ullapool (Druce). 106. E. Ross : Altguish (Marshall). 108. W. Sutherland : Inchnadamph (Marshall). 111. Orkney : Hoy (Fortescue).

Ireland.—28. Sligo : Glenade (Vowell). 38. Down : Mourne Mts. (Stewart). 39. Antrim : Sallagh Braes (Stewart). Glenariff (Shoolbred). 40. Londonderry : Benevenagh (Waddell).

var. *amplexicaule*.

69. Westmorland : High Street (Backhouse). Grisedale! 72. Dumfries : Moffat (Linton). 87. W. Perth : Callander (Borrer). 88. Mid Perth : Ben Laoigh and Ben Lawers (Hanbury). Craig Cailleach (E. G. Baker). Crianlarich! 89. E. Perth : Glen Beg (Marshall). 90. Forfar : Clova! 92. S. Aberdeen : Glen Callater (Backhouse). 96. E. Inverness : Dalwhinnie (Marshall). 97. W. Inverness : Glen Spean (Marshall). Glen Roy! 98. Argyll : Kingshouse (Marshall). 100. Clyde Isles : Glen Sannox, Arran (Bailey). 104. N. Ebudes : Sligachan, Skye (Foggitt). 105. W. Ross : Ullapool (Shoolbred). 106. E. Ross : Scur Vuillin (Marshall). 108. W. Sutherland : Inchnadamph (Marshall). 110. Outer Hebrides : S. Uist (Shoolbred). 111. Orkney : Hoy (Sinclair).

Ireland.—2. N. Kerry : Mangerton (Ridley). Brandon (Linton). 9. Clare : Corrofin (Stelfox). 15. S.E. Galway : Castle Taylor (A. G. More). 16. W. Galway : Bennabola (Backhouse). 27. W. Mayo : Rossesk Abbey (Praeger). 28. Sligo : Ben Bulben (Lousley). 29. Leitrim : Kinlough (Vowell). 39. Antrim : Garron Pt. (Praeger).

var. *Hartii*.

Ireland.—28. Sligo : Ben Bulben (Linton). 35. W. Donegal : Slieve League (Hanbury).

Endemic.

35. *HIERACIUM BRIGANTUM* (F. J. Hanbury) Roffey in Lond. Cat. ed. 11 (1925); *H. lima* var. *brigantum* Hanb. in Journ. Bot. xxx. 206 (1892); in Bab. Man. ed. 9, 242 (1904); *H. anglicum* var. *brigantum* W. R. Lint. Brit. Hier. 12 (1905).

Ersicc.—Linton no. 162 (Clapham, W. Yorks); R. F. Thompson, Moughton Scars, 1891; both in Hb. Mus. Brit.

Stem 20–30(–50) cm. high, robust, sparingly pilose below, floccose and softly pilose above. *Radical leaves* thick, dull dark green; the primordial broadly oval or rotundate, usually mucronate, subentire and abruptly narrowed below; the later \pm large, oval to ovate-lanceolate, \pm acute, with broad, shallow, often apiculate teeth, chiefly towards the base, or sometimes subentire, subtruncate or shortly contracted below to rather long, pilose petioles; *stem-leaf generally* 1, lanceolate, acuminate, occasionally dentate below, to linear-lanceolate and bractlike; all clothed on both surfaces, especially above, with numerous, stiff, bulbous-based hairs, margins ciliate. *Inflorescence* racemose- or sub-corymbose, with 1–5(–8, cult.) heads, the lateral generally long-peduncled and exceeding the accladium, the peduncles floccose with \pm numerous black-based pilose and dark glandular hairs. Heads large, handsome, ventricose below. *Phyllaries* incumbent in bud, greyish green, long and attenuate, linear-lanceolate, acute, \pm floccose and senescent, densely pilose with long, black-based hairs as in *H. anglicum*, sometimes with shorter glandular hairs intermixed. Ligules light yellow, sparingly pilose-tipped. Styles yellow. Margins of receptacle-pits dentate-fimbriate. Achenes reddish black, about 3.5 mm. long.

H. brigantum, which was associated by Hanbury not with *H. anglicum* but with *H. lima* Hanb., and was transferred as a variety to the former by W. R. Linton,

resembles *H. anglicum* in its large foliage and lax inflorescence of large heads with dentate-fimbriate receptacle-pits, but differs in its thicker, dull green leaves clothed, particularly above, with stiff, bulbous-based hairs. It also has yellow instead of livid styles. Its rough foliage and yellow styles induced Hanbury to place it under *H. lima*, but this Cheddar plant is clearly separable by its less robust habit and still rougher foliage, as well as by its smaller heads with porrect phyllaries and glabrous-tipped ligules. *H. lima* was transferred by W. R. Linton, and apparently rightly, to the Section *Oreadea*.

Distribution.—64. M.W. Yorks : Giggleswick and Catterick Ghyll (Hanbury). Settle (R. F. Thompson). Clapham (Linton). Heseldon Glen !

Endemic.

36. *HIERACIUM EBUDICUM* sp. nov.

Exsicc.—Shoolbred, Clisham, 1894 (type), in Hb. Hanbury.

Caulis (8-)15-20(-30) cm., vulgo gracilescens, basin versus parce longe-pilosus, sursum pilis sparsis basi atris glandulisque tenuibus obscuris \pm floccosus. *Folia radicalia* glaucescentia; plurima ovata ad ovalia vel ovato-lanceolata, obtusomucronata ad acuminata, dentibus inferioribus sensim horizontalibus argute denticulata vel etiam inferne dentata, basi rotundata ad truncata; caulinum 0 vel 1, saepissime lineare, bracteaeforme, raro majus, ovato-lanceolatum, acuminatum, dentatum, in petiolum late alatum infra angustatum; omnia in paginâ superiore pilis brevibus rigidiusculis vestita, subter costâ dorsali villosâ mollius pilosa, marginibus ciliatis petiolisque longe-villosis. *Anthela* 1-2(-3)-cephala, ramo longiuseculo, si adsit, acladium superante pedunculisque parce floccosis glandulis numerosis imparibus obscuris pilisque nonnullis praeditis. *Involucra majuscula*, basi rotundata. *Squamae in gemmis porrectae, atro-virides*, longae, attenuatae (intimae fere filiformes), plurimae lineari-lanceolatae, tenuiter acuminatae, inferne \pm floccosae, pilis multis longis basi atris glandulisque \pm densis imparibus obscuris vestitae. *Ligulae* claro-luteae, apice valde pilosae. *Styli lutei*. Alveoli receptaculi margine dentato-fimbriati.

Stem (8-)15-20(-30) cm. high, usually slender, sparingly long-pilose about the base, becoming \pm floccose with scattered dark-based pilose and fine, dark glandular hairs above. *Radical leaves* glaucescent; the primordial small, subrotund-ovate, rounded-obtuse-mucronate, subentire, nearly truncate-based; the later ovate to oval or ovate-lanceolate, obtuse-mucronate to acuminate, sharply denticulate or sometimes dentate below with the lower teeth becoming horizontal, rounded- to truncate-based; stem-leaf 0 or 1, generally linear and braetlike, rarely larger, ovate-lanceolate, acuminate, dentate and narrowed below to a broadly winged petiole; all clothed above with short, rather stiff hairs, more softly pilose beneath with villous midrib and ciliate margins, petioles long-villous. *Inflorescence* 1-2(-3)-headed, the lateral branch, when present, rather long and exceeding the acladium; peduncles sparingly floccose, with numerous unequal, dark glandular and some pilose hairs. *Heads* rather large, rounded below. *Phyllaries* porrect in bud, blackish green, long and attenuate (the innermost almost filiform), mostly linear-lanceolate, finely acuminate, \pm floccose below, clothed with many long, black-based pilose and \pm dense, unequal, dark glandular hairs. *Ligules* clear yellow, strongly pilose-tipped. *Styles* yellow. Margins of receptacle-pits dentate-fimbriate. Achenes reddish black, about 3.5 mm. long.

H. ebudicum is unique among the *Cerinthoidea* in its combination of broad, truncate-based leaves with sharp, spreading denticulations, long, attenuate phyllaries and yellow styles. It is of a dwarfer habit of growth than any other member of the group except *H. Shoolbredii* and *H. scarpicum*.

It was originally gathered by Shoolbred in 1894 near Clisham, in North Harris, Outer Hebrides, and on Gilaval Glas and Rognaver, in South Harris; and left unnamed by him. In 1937 Mr. Wilmott obtained a single specimen at Scaladale, in the same vicinity, and in 1939 it was found in greater quantity both in North Harris and the Uig district of Lewis. This later material has enabled its position in the genus to be determined. It grows along riversides, where it attains a height of 20 to 30 cm., and on rock-ledges of the higher hills, where it is much dwarfer (10–15 cm.) and with darker heads. The rock plants have the aspect of species of the *Subalpina*.

This addition to the Flora is especially noteworthy in view of the numerous species of this Section described from the Faeroes, from all of which it seems to be distinct.

Distribution.—110. Outer Hebrides: Clisham (Shoolbred), Scaladale (Wilmott) and Sgaoth Ard (J. W. Campbell), N. Harris. Gilaval Glas and Rognaver, S. Harris (Shoolbred). Uig, Lewis (Bangerter and Crabbe).

Endemic.

37. *HIERACIUM HEBRIDENSE* sp. nov.

Essicc.—Wilmott no. 370712E (type); Miss Campbell, Ard Meavaig, 1937; both in Hb. Mus. Brit.: Shoolbred, Luskentyre, 1894, in Hb. Hanbury.

Caulis 20–40 cm., \pm robustus, inferne sparsim longe pilosus, sursum pilis tenuibus basi atris numerosis glandulisque exiguis solitariis \pm floccosis. *Folia radicalia* glaucescentia, plurima magna, *ovalia* ad oblonga vel elliptico-lanceolata, obtusomucronulata ad acuta, *obscure glanduloso-denticulata* et nonnunquam *basin abrupte contractam vel subcuneatam* versus haud alte sinuato-dentata; *caulina* 0–2, inferius lanceolatum vel ovato-lanceolatum, acuminatum, subintegrum, inferne angustatum, superius parvum, lineare, bracteaeforme; *omnia utrinque pilosa*, in paginâ inferiore longius (praesertim ad costam dorsalem), marginibus ciliatis petiolisque crinibus longissimis denticulatis villosis. *Anthela furcato-corymbosa ad subaggregata*, 2–9-cephala, ramis suberectis longiusculis acladium superantibus, pedunculis parce floccosis glandulis obscuris numerosis pilisque nonnullis obsitis. *Involucra majuscula* ad medioeria, inferne rotundata. *Squamae* in gemmis incumbentes, *atro-virides*, lineari-lanceolatae, subacutae, basin versus parce floccosae, leviter senescentes, *pilis multis albidis basi nigricantibus glandulisque obscuris brevioribus vestitae*. *Ligulae luteae, apice paulo pilosae*. Styli lividi. Alveoli receptaculi margine dentato-fimbriati.

Stem 20–40 cm. high, \pm robust, sparingly long-pilose below, becoming somewhat floccose above with numerous fine, black-based pilose and occasional fine glandular hairs. *Radical leaves* light green, glaucescent; the primordial broadly oval, rounded-obtuse-mucronulate, remotely denticulate, abruptly narrowed below; the later large, *oval* to oblong or elliptic-lanceolate, obtuse-mucronulate to acute, *obscurely glandular-denticulate* and sometimes shallowly sinuate-dentate towards the *abruptly contracted or subcuneate base*; *cauline* 0–2, the lower lanceolate or ovate-lanceolate, acuminate, subentire, contracted below, the upper small, linear and bractlike; all *pilose above and more so with longer hairs beneath* (especially about the midrib), margins ciliate and petioles villous with very long, denticulate hairs. *Inflorescence furcate-corymbose to subaggregata*, 2–9-headed, with suberect, \pm long branches exceeding the acladium, the peduncles sparingly floccose with numerous dark glandular and some pilose hairs. *Heads rather large* or of medium size, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-lanceolate, subacute, sparingly floccose below and slightly senescent, *with many whitish, black-based pilose and shorter, dark glandular hairs* intermixed. *Ligules full yellow, sparingly pilose-tipped*. Styles livid. Margins of receptacle-pits dentate-fimbriate. Achenes blackish, about 4 mm. long.

This plant appears to have been first collected by Shoolbred in 1894 at Beesdale, Luskentyre, in Harris (Outer Hebrides). He named his specimens *H. anglicum* Fr., but this was corrected in Herb. Hanbury to *H. pictorum* var. *dasythrix* Linton. In 1937 Mr. Wilmott and Miss M. S. Campbell obtained examples of the same plant from Scaladale and other stations in North Harris, and, like Shoolbred, referred their specimens to *H. anglicum*. More and better material was gathered in 1939, and in 1940 and 1941 it was collected in numerous stations in N. and S. Harris by Prof. Heslop Harrison. In habit and hair-clothing of the foliage this plant resembles *H. anglicum*, but its heads are smaller, more glandular and much less pilose, and its ligules are full yellow and only sparingly ciliate. With these points of difference, which seem constant in a large number of specimens from different localities, the plant cannot be regarded as a form of *H. anglicum*, but it seems to belong to the group *Cerinthoidea*, especially as the ciliation of the alveoles is well marked. It is therefore described as a new species, *H. hebridense*, and placed in this group. The interest of this addition to our flora, which does not seem closely allied to any of the species of this Section described from the Faeroes, has already been commented upon.

Distribution.—110. Outer Hebrides: S. Harris, Luskentyre (Shoolbred). N. Harris, Ard Meavaig (Miss Campbell) and Scaladale (Wilmott).

Endemic.

38. *HIERACIUM AMPLIATUM* (W. R. Linton) Ley in Journ. Bot. xlvii. 47 (1909). *H. sarcophyllum* var. *ampliatum* W. R. Lint. Brit. Hier. 54 (1905); *H. sagittatum* subsp. *sarcophyllum* var. *ampliatum* Zahn, l. c. 347 (1921); pro parte. *H. anglicum* var. *calcaratum* Lint. in Journ. Bot. xxxix. 105 (1901); Williams, l. c. 94 (1902); W. R. Lint. Brit. Hier. 11 (1905); *H. olivaceum* subsp. *jaculifolium* subvar. *calcaratum* Zahn, l. c. 191 (1921); pro parte.

Exsicc.—Ley, Ingleborough, 1902. and Beezley Glen, 1903, as *H. ampliatum*; Linton no. 126 (Kendal), as *H. anglicum* var. *calcaratum*; all in Hb. Mus. Brit.

Stem 20–50 cm. high, robust, striate, sparingly pilose, becoming also floccose upwards. *Radical leaves* glaucous, ± long petioled; the primordial subrotund-oval, rounded-obtuse-mucronulate, with short, spreading teeth or denticulations, abruptly contracted below; the later (often large) oval or oblong, obtuse-mucronate to subacute (the innermost more lanceolate and acuminate), *undulate-dentate* becoming denticulate towards the apex, and frequently with a few coarse, spreading teeth about the abruptly narrowed or subtruncate base; *stem-leaf* 0–1(–2), lanceolate, acuminate, often sharply dentate towards the base, distinctly petiolate, or sometimes small, ± linear and bractlike; all ± pilose on both surfaces, with ciliate margins and villous petioles. *Inflorescence* furcate-corymbose, sometimes with a long lower branch, 2–10-headed, with ± short acledium and straight, spreading branches with peduncles shorter than in *H. anglicum*; the peduncles densely floccose, with numerous dark pilose and glandular hairs. Heads large, rounded below. *Phyllaries* incumbent in bud, dark greyish green, broader and more shortly pilose than in *H. anglicum*, with some dark glandular hairs intermixed, floccose (especially on the margins) and senescent. *Ligules* pilose-tipped. *Styles* livid. *Margins* of receptacle-pits dentate-fimbriate. *Achenes* blackish, about 4 mm. long.

β. *jaculifolium* (Hanb.) comb. nov.

H. anglicum var. *jaculifolium* Hanb. in Journ. Bot. xxx. 168 (1892); in Bab. Man. ed. 9, 240 (1904); Williams, l. c. 94 (1902); W. R. Lint. Brit. Hier. 11 (1905); *H. olivaceum* subsp. *jaculifolium* Zahn, l. c. 191 (1921).

Exsicc.—Linton no. 104 (Keswick); Foggitt, Anna Well, 1932? both in Hb. Mus. Brit.

Radical leaves long-petioled; the primordial oval, \pm acute; the later large, usually ovate or jaculiform, acuminate, subtruncate below with \pm long, horizontal basal teeth, and shorter teeth above, becoming denticulate upwards; stem-leaf normally 1, rather large, ovate, acuminate, with coarse, spreading basal teeth, abruptly contracted to a winged petiole; all subglabrous above. Peduncles densely floccose, with some fine, black-based pilose and a few glandular hairs. Heads rather large, generally stylose-flowered. Otherwise resembling the type.

γ. gracilius var. nov.

Exsicc.—Fox, Dove Craggs, Fairfield, 1890 (type); Ley, Dollywaggon, 1905; both in Hb. Mus. Brit.

Caulis 20–40 cm., parcissime pilosus, effloccosus. Folia radicalia haud magna, longe petiolata, quam in typo basi minus abrupte angustata, tenuius dentata, minus pilosa; caulinum parum dentatum. Anthela 1–5 capitulis satis compacta, paululum floccosa, multis pilis obscuris glandulisque hirsuta. Involucra floribus tubulosis inferne vix rotundata. Squamae obscure virides, floccoso-limbatae, paulo senescentes, pilis multis obscuris breviusculis glandulisque nonnullis vestitae. Styli obscure lividi.

Stem 20–40 cm. high, very sparingly pilose, effloccose. Radical leaves of moderate size, long-petioled, less abruptly narrowed below than in the type, more finely dentate and less pilose; stem-leaf but little toothed. Inflorescence 1–5-headed, rather compact, slightly floccose, with many dark pilose and glandular hairs. Heads scarcely rounded below, stylose-flowered. Phyllaries dark green, floccose-edged and slightly senescent, with many rather short, dark pilose and some glandular hairs. Styles dark livid.

The varying forms of this plant were originally described as varieties *calcaratum* and *jaculifolium* of *H. anglicum* Fr. and were consistently so treated until separated from *H. anglicum* by Zahn (l. c.). In 1905 W. R. Linton (l. c.) introduced a new variety *ampliatum* under *H. sarcophyllum* Stenstr., a species of the Section *Vulgata*, based on specimens collected by himself and Ley in 1902 around Ingleborough. Examples of this new variety were sent in 1907 to Dahlstedt, who wrote of it, 'Not at all *sarcophyllum*. Is not related to it. It has greater heads with different clothing and other sorts of leaves'. In view of this opinion the plant was raised to specific rank by Ley in 1909 (l. c.) as *H. ampliatum*, and placed next after *H. sarcophyllum* among the *Vulgata*. An examination of the original Yorkshire specimens, however, shows not only that they are distinct from *H. sarcophyllum*, as asserted by Dahlstedt, but that they belong to the group *Cerinthoidea* and are, indeed, inseparable from *H. anglicum* var. *calcaratum* Lint.

The two varieties *calcaratum* and *jaculifolium* of *H. anglicum* were separated by Zahn (l. c.) from the typical species and united as a new subspecies *jaculifolium* under *H. olivaceum* Gren. and Godr., and as their removal from *H. anglicum* seems justified, they are here combined with *H. ampliatum* and treated as a full species, for which Ley's name, being the earliest, must be used, although he never recognized the real affinity of the plant to which he applied it.

H. ampliatum is separable from the three preceding species, *H. anglicum*, *H. brigantum* and *H. hebridense*, by its normally more truncate-based radical leaves and its petiolate stem-leaf, as well as its more compact inflorescence with shorter aeladium and peduncles. *H. ebudicum* differs widely in its dwarfer habit, fewer heads with finely pointed phyllaries, and yellow styles. There is a specimen in Herb. Mus. Brit. (T. J. Foggitt, Tilberthwaite Glen, Coniston, 1917, as *H. anglicum*) which is apparently a ligulate form of the variety *jaculifolium*.

Distribution.—64. M.W. Yorks: Heseldon Glen (Ley). Ingleboro' and Beezley Glen! 65. N.W. Yorks: Dent Dale (Oliver). 69. Westmorland: Kendal (Linton). Coniston Old Man (Mennell).

Ireland.—39. Antrim : Glendun and Torr Head (Praeger).

var. *jaculifolium*.

69. Westmorland : Anna Well (Foggitt). Tilberthwaite Gill (Roffey). 70. Cumberland : Keswick !

var. *gracilius*.

66. Durham : Upper Teesdale (Wilmott). 69. Westmorland : Dove Craggs ! Dollywaggon Pikes (Ley).

Endemic.

39. *HIERACIUM PETROCHARIS* (Linton) W. R. Linton, Brit. Hier. 51 (1905) ; *H. caesium* var. *petrocharis* Lint. in Journ. Bot. xxxi. 180 (1893) ; *H. insulare* var. *petrocharis* Hanb. in Bab. Man. ed. 9, 256 (1904) ; *H. caesium* subsp. *petrocharis* Zahn, l. c. 438 (1921).

Exsicc.—Linton no. 20 (Killin) ; Marshall nos. 3010 (Glen Shee), 3518 (Ben Laoigh) and 3519 (Dalmally) ; all in Hb. Mus. Brit.

Stem 20–40 cm. high, \pm robust, striate, glabrescent or sparingly pilose below, becoming floccose with numerous black-based pilose and often a few dark glandular hairs above. *Radical leaves pale green*, occasionally slightly purple-spotted ; the primordial oval, rounded-obtuse-mucronulate, denticulate, shortly contracted below ; the later *oblong* to lanceolate, obtuse-mucronate to acute, *denticulate* (sometimes obscurely) or the inner with a few shallow teeth, *shortly cuneate-based* ; *stem-leaf* 0–1, lanceolate to linear-lanceolate, subentire, sessile ; all *pilose on both surfaces* or glabrescent above, with ciliate margins and the petioles \pm villous with long, denticulate hairs. *Inflorescence furcate-subcorymbose*, 1–4(–7)-headed, with \pm long, *incurved peduncles*, which are densely floccose with numerous black-based pilose and a few dark glandular hairs. Heads large, subtruncate-based. *Phyllaries* nearly connivent in bud ap. W. R. Linton, *dark greyish green*, linear-lanceolate, mostly acute, very floccose, especially on the margins, often senescent, *densely pilose* with long, whitish, dark-based hairs, with a few shorter glandular hairs intermixed. *Ligules full yellow*, glabrous- or occasionally *partially pilose-tipped*. Styles livid. Margins of receptacle-pits distinctly dentate-fimbriate. Achenes reddish black, nearly 4 mm. long.

H. petrocharis was originally described as a variety of *H. caesium* Fr., but was raised to specific rank by W. R. Linton and transferred to his group *Subvulgata*. Its little toothed leaves and few-headed inflorescence, with large heads borne on long, incurved peduncles, as well as its partially pilose-tipped ligules, livid styles and fimbriate alveoles, clearly indicate an affinity with the *Cerinthoidea*, and it is therefore treated in this group. Herbarium specimens are liable to be confused with *H. anglicum*, but its foliage is not glaucous and its florets are of a full yellow colour. There is good material of this plant in Herb. W. R. Linton at Liverpool. A form perhaps identical with it, of which more material is desirable, was collected by Prof. Heslop Harrison in 1930 on the island of Coll, in the Hebrides.

Distribution.—88. Mid Perth : Ben Laoigh ! Killin (Linton). Ben Dubh Craige (Groves). 89. E. Perth : Glen Shee (Marshall). 90. Forfar : Clova ! Canlochen ! 98. Argyll : Dalmally (Marshall).

Endemic.

40. *HIERACIUM LANGWELLENSIS* F. J. Hanbury in Journ. Bot. xxvi. 206 (1888) ; in Bab. Man. ed. 9 242 (1904) ; W. R. Lint. Brit. Hier. 12 (1905) ; *H. olivaceum* subsp. *langwellense* Zahn, l. c. 190 (1921).

Exsicc.—Linton no. 60 (Lybster); Linton, Helmsdale, 1888, and Black's Hope, Moffat, 1890; Marshall nos. 1777 and 3270; all in Hb. Mus. Brit.

Stem 20–50 cm. high, robust, striate, sparingly pilose, floccose and with black-based hairs above. *Radical leaves* few (or many, cult.), *yellowish green*; the primordial oval to oblong, mucronate, subentire or with a few broad, shallow teeth towards the shortly contracted base; the later *large, long-lanceolate*, acute, *denticulate or sharply dentate* chiefly towards the base, *attenuate below* to long petioles; *stem-leaves* 1–3, the lowest placed low, petiolate and resembling the inner basal leaves, the second lanceolate, acuminate, sharply toothed below, sessile, sometimes slightly floccose as well as pilose beneath, the uppermost small, linear-lanceolate; all *sparingly pilose above, more densely so beneath*, with ciliate margins and pilose petioles. *Inflorescence* *racemose-corymbose*, 3–4(–15)-headed, *with rather long, erect-spreading peduncles*, which are densely floccose, with a few glandular and many long, spreading, black-based pilose hairs. Heads rather large, rounded below. *Phyllaries* \pm incumbent in bud, *olive-green*, linear-lanceolate, obtuse or subacute, floccose especially towards the apex and margins, *with many dark-based pilose hairs* and sometimes a few small glandular hairs intermixed. *Ligules full yellow*, sparingly pilose-tipped. Styles livid or yellow. Margins of receptacle-pits dentate, long-ciliate. Achenes blackish, 3.5–4 mm. long.

This plant is less closely allied to *H. anglicum* than are most of the other scapigerous species of this Section. Its long, yellowish green and not glaucous leaves, and its full yellow flowers are distinctive. In cultivation it becomes very luxuriant and floriferous. A handsome form collected by Corstorphine in 1933 in Glen Dole, Clova, may belong here, but differs from the typical plant by its larger and darker heads, deeply dentate but not ciliate alveoles and very long (–4.5 mm.) achenes.

Distribution.—72. Dumfries: Moffat (Linton). 88. Mid Perth: Killin (Ewing). 89. E. Perth: Blairgowrie! Glen Shee (Marshall). 92. S. Aberdeen: Braemar! 97. W. Inverness: Glen Spean (Marshall). 106. E. Ross: Oyckell Bridge (Marshall). 107. E. Sutherland: Helmesdale (Linton). Lairg! 109. Caithness: Berriedale and Lybster (Linton). Langwell Water (Hanbury).

Endemic.

41. *HIERACIUM FLOCCULOSUM* Backhouse, Mon. 60 (1856), Williams, l. c. 118 (1902); Hanb. in Bab. Mon. ed. 9, 241 (1904); W. R. Lint. Brit. Hier. 12 (1905); *H. olivaceum* subsp. *flocculosum* Zahn, l. c. 191 (1921).

Icon.—Eng. Bot. ed. 3, t. 848.

Exsicc.—Backhouse, Dhuloch, 1855 (Hb. Syme); Linton, Braemar, 1897; both in Hb. Mus. Brit.

Stem (15–)30–40(–60) cm. high, \pm slender, floccose and sparingly pilose throughout. *Radical leaves* few, dull glaucous green, rarely faintly spotted; the primordial broadly obovate or subspathulate, subentire, very obtuse, mucronate, shortly contracted below; the later \pm large, *obovate to oval*, obtuse-mucronate to shortly acuminate (narrower and more acute in some dwarf forms), *subentire* or remotely denticulate, or in luxuriant plants slightly repand-dentate, *narrowed below* to long, pilose and floccose petioles; *stem-leaves generally* 2, the lower large, oblong, acute, \pm dentate in the lower half, \pm amplexicaul or narrowed to a broadly winged petiole, the upper smaller and narrower, sessile, sometimes \pm bractlike; all \pm floccose on both surfaces, especially beneath, and with pilose hairs chiefly on the margins and the lower side of the midrib. *Inflorescence* *lax, racemose-corymbose*, 1–6(–8)-headed, *with relatively long peduncles*, which are densely floccose with numerous glandular and fewer long pilose hairs; occasionally a long branch from the

lower cauline leaf. Heads rather large, ovoid. *Phyllaries* incumbent in bud, *greyish green*, linear-lanceolate, subacute (innermost acute), floccose, senescent, *with many dark-based pilose and dark glandular hairs*. *Ligules* nearly glabrous-tipped. Styles light livid. Margins of receptacle-pits dentate-fimbriate. Achenes reddish black, 4 mm. long.

β. denticulatum var. nov.

Exsicc.—Linton no. 81 (Braemar) (type); Linton, Linn of Quoich, 1889; both in Hb. Mus. Brit. as *H. flocculosum*.

Caulis quam typi minus floccosus. Folia radicalia caulinaque elliptica ad elliptico-lanceolata, acuta, dentibus minimis subulatis patentibus remote denticulata, in paginâ inferiore solâ floccosa (saepe parce). Pedunculi squamaeque quam in typo pilosiores minus glandulosi. Styli lutei.

Stem less floccose. Radical and cauline leaves elliptic to elliptic-lanceolate, acute, remotely denticulate with fine, spreading, subulate teeth, floccose, often sparingly, on the underside only. Peduncles and phyllaries more pilose and less glandular than in the type. Styles yellow.

γ. angustifolium var. nov.

Exsicc.—Stewart and Praeger, Spinkwee River, Mourne Mts., Co. Down, 1890 (type in Hb. Dublin).

Caulis quam typi minus floccosus. Folia radicalia interiora longe lanceolata, acuta, denticulata, utrinque ±floccosa. Pedunculi squamaeque pilis numerosis vestiti, fere eglandulosi. Aliter ut in typo.

Stem less floccose. Later radical leaves long-lanceolate, acute, denticulate, ±floccose on both surfaces. Peduncles and phyllaries with many pilose hairs, almost eglandular.

As described by Backhouse, this plant has dentate or denticulate leaves, clothed on both surfaces with minute stellate down. In the neighbourhood of Braemar, where Backhouse collected, two forms, readily separable, grow in company. The more abundant form has denticulate, or occasionally dentate foliage, which is floccose on the underside only and sometimes but sparingly so there, except on the stem-leaves. The other and rarer plant has more obtuse and subentire radical leaves, which are more or less floccose on both surfaces, as given in Backhouse's description. It is clear that Backhouse did not distinguish these two forms, both of which figure as *H. flocculosum* in his herbarium.

The rarer and more extreme form is now taken as the typical form of *H. flocculosum*, and the other, which is readily recognizable, is treated as a distinct variety. In the Mourne Mts., in Ireland, another form seems to merit distinction owing to its narrow leaves and less glandular inflorescence. Specimens collected by Marshall near Inchnadamph, in West Sutherland (nos. 3298 and 3332, as *H. eustales*), apparently belong to *H. flocculosum* but differ in the sparser hair-clothing of the phyllaries.

H. flocculosum bears a considerable resemblance to *H. anglicum*, but is usually of slenderer habit, with the clothing of the foliage predominantly floccose. Its flower-heads are normally distinctly smaller than in *H. anglicum*. It is curious that it was not placed by Backhouse in his Monograph among his *Nigrescentia* near *H. anglicum*, but with the *Pallida* next to *H. vulgatum* Fr.

Distribution.—88. Mid Perth: Ben Laoigh (Hanbury). 89. E. Perth: Glen Beg (Marshall). 90. Forfar: Den of Airlie and Canlochen (Corstorphine). 92. S. Aberdeen: Cairntoul and Dhuloch (Backhouse). Braemar! 96. E. Inverness: Glen Eunach (Groves and Roffey). 106. E. Ross: Oyckell Bridge (Marshall). 108. W. Sutherland: Inchnadamph (Marshall). Altnaharra (Hanbury). 110. Outer Hebrides: S. Uist (Heslop Harrison).

Ireland.—39. Antrim : Sallagh Braes (Stewart).

var. *denticulatum*.

89. E. Perth : Glen Shee (Linton). 90. Forfar : Clova (Backhouse). 92. S. Aberdeen : Cairntoul (Backhouse). Braemar ! Glen Callater (Wallace).

var. *angustifolium*.

Ireland.—38. Down : Tollymore (Stewart and Praeger).

Endemic.

42. *HIERACIUM SHOOLBREDII* E. S. Marshall in Journ. Bot. li. 121 (1913); *H. anglicum* var. *longibracteatum* Hanb. in Journ. Bot. xxvii. 75 (1889); in Bab. Man. ed. 9, 240 (1904); Williams, l. c. 94 (1902); W. R. Lint. Brit. Hier. 11 (1905); *H. olivaceum* subsp. *flocculosum* subvar. *longibracteatum* Zahn, l. c. 191 (1921).

Exsicc.—Linton no. 31 (Sgnorr-na-Insse); Linton, Harta Corrie, Skye, and Bettyhill, 1888; Marshall nos. 3602 and 3603; all in Hb. Mus. Brit.

Stem 15–30(–45, cult.) cm. high, erect, *slender*, ±sparingly floccose and pilose. *Radical leaves* thin, glaucous or bluish green and paler or purple-tinted beneath, with moderately long petioles; the primordial small, oval-orbicular, subentire, apically rounded or subtruncate and mucronate, and abruptly rounded below; the later larger, *oval to oblong-ovate*, mucronate to acute, finely *denticulate or subentire* with a few (generally short) horizontal or deflexed teeth near the *subtruncate, rounded or shortly contracted base*; *stem-leaf* 1, broadly ovate, acuminate, ±toothed below, sessile and semi-amplexicaul, or narrower, linear or bractlike; all *glabrescent above and floccose beneath*, with soft pilose hairs on the margins, the underside of the midrib and more markedly on the petioles. *Inflorescence racemose-corymbose*, with 1–4(–6) heads borne on *slender, erect peduncles*, which are floccose with a few spreading pilose hairs and more dark glandular hairs intermixed. Heads large, rounded below. *Phyllaries porrect in bud, dark green, long, linear-lanceolate, attenuate and very acute*, ±sparingly floccose, senescent, *with black-based pilose hairs* and more numerous dark glandular hairs intermixed. Ligules light yellow, pilose-tipped. Styles livid. Margins of receptacle-pits strongly dentate-fimbriate. Achenes blackish, about 3.5 mm. long, with very long pappus.

This plant was originally described by Hanbury as a variety *longibracteatum* of *H. anglicum*, and numerous specimens exist in herbaria under this name obtained by various collectors in the Scottish Highlands, chiefly on the western side. In 1913 *H. Shoolbredii* was described by Marshall (l. c.) as a new species from the neighbourhood of Dalwhinnie, and treated as an ally of *H. sanguineum* Ley and *H. silvaticum* var. *tricolor* W. R. Lint. without any allusion to *H. anglicum* var. *longibracteatum*. There is good authentic material of this new species in Herb. Mus. Brit., which shows that it is inseparable from *H. anglicum* var. *longibracteatum*, and it is difficult to understand why this identity was overlooked.

H. Mougeotii subsp. *skyense* Zahn, l. c. 186, of which no authentic material has been seen, appears from Zahn's description to be also identical with *H. Shoolbredii*.

H. Shoolbredii apparently differs from all the forms of *H. anglicum* by its essentially dwarfer and slenderer habit, its glabrescent foliage (floccose beneath), its erect peduncles and its less shaggy heads. Its habit and peduncles similarly distinguish it from *H. flocculosum*, which also has leaves of a very different outline. *H. ebudicum*, which it resembles in its dwarf habit and elongate, porrect phyllaries, differs by its sharply toothed, stiffly pilose foliage and yellow styles.

Distribution.—88. Mid Perth : Glen Lochay (Ewing). 89. E. Perth : Pitlochry (Buchanan-White). Blair Athol (Ewing). Sow of Athol (Marshall). 90. Forfar :

Clova (Linton). Glen Dole (Corstorphine). 96. E. Inverness : Dalwhinnie (Marshall). 97. W. Inverness : Ben Nevis ! Sgorr-na-Inse and Fersit Forest (Marshall). Loch Laggan (Hanbury). 98. Argyll : Clach Leathad (Hanbury). Invermoidart (Macvicar). 104. N. Ebudes : Harta Corrie, Skye (Linton). Raasay (Cooke). Rhum (K. B. Blackburn). 105. W. Ross : Inverbroom (Riddelsdell). Slioch (Salmon). 108. W. Sutherland : Bettyhill (Linton). Inchnadamph and Cashel Dhu (Hanbury). 109. Caithness : Thurso (Riddelsdell). 110. Outer Hebrides : Harris (Shoolbred). S. Uist (Heslop Harrison).

Endemic.

Series **Irica**. (See page 68.)

43. *HIERACIUM IRICUM* Fries, Symb. 60 (1848) ; Epier. 59 (1862) ; Backh. Mon. 40 (1856) ; Williams, l. c. 95 (1902) ; Hanb. in Bab. Man. ed. 9, 241 (1904) ; W. R. Lint. Brit. Hier. 13 (1905) ; *H. Lapeyrousii*, Bab. in E.B. Suppl. no. 2915 (1847), non Fröhl. in DC. Prodr. vii. 232 (1838) ; *H. Mougeotii* subsp. *iricum* Zahn, l. c. 182 (1921).

Icon.—Eng. Bot. Suppl. t. 2915, as *H. Lapeyrousii* (E.B. ed. 3, t. 838).

Exsicc.—Linton no. 59 ; Linton, Braemar, 1883, Bettyhill, 1888, and Killarney, 1885 ; all in Hb. Mus. Brit.

Stem (10–)30–40(–60) cm. high, *robust*, usually pilose throughout with long (–6 mm.), waved hairs, and \pm floccose, with black-based hairs above. *Radical leaves* firm, glaucous, sometimes tinged with red ; the primordial elliptic to oval, obtuse-mucronate, remotely denticulate, shortly contracted below ; the later often large, *elliptic to oblong-lanceolate*, acute, *remotely denticulate to sharply dentate* with ascending teeth (chiefly towards the base), narrowed below to winged (sometimes long) and shaggy petioles ; *stem-leaves* 3–6(–9, *cult.*), *decreasing upwards*, the lowest resembling the innermost radical but sharply or coarsely toothed and shortly petioled, the remainder \pm ovate, acuminate, sharply toothed, semi-amplexicaul ; all *long-pilose*, especially beneath. *Inflorescence sub-corymbose*, with straight, suberect branches exceeding the accladium and 1–16(–20, *cult.*) heads, the peduncles floccose, with glandular and \pm scattered, black-based pilose hairs. *Heads* large and handsome, *broad* and subtruncate-based. *Phyllaries* incumbent in bud, *dark green*, linear-lanceolate, broad below, subacute, slightly floccose, *densely pilose* with black-based hairs and \pm numerous shorter glandular hairs intermixed. *Ligules full yellow*, with tips shortly pilose. Styles livid. Margins of receptacle-pits dentate and strongly fimbriate. Achenes blackish, 3.5–4 mm. long.

This handsome plant, distinguishable from all the preceding species of the Section by its cauligerous habit, is very uniform throughout its range in Great Britain and Ireland. In cultivation it tends to a greater vegetative luxuriance with a larger number of smaller heads.

Distribution.—65. N.W. Yorks : Upper Teesdale ! 70. Cumberland : Cross Fell (Wilmott). 72. Dumfries : Moffat (Linton). 89. E. Perth : Glen Shee (Marshall). 90. Forfar : Clova (Linton). Glen Dole (Corstorphine). 92. S. Aberdeen : Braemar ! 94. Banff : Bridge of Aan (Roffey). 104. N. Ebudes : Skye (Cuchullins, Sneasdal, Uig and Stigachan) (Linton). 105. W. Ross : Kishorn (Druce). 106. E. Ross : Scur Vuillin (Marshall). 107. E. Sutherland : Oyckell Bridge (Marshall). 108. W. Sutherland : Durness (Trethewy). Inchnadamph (Salmon). Lochinver (Marshall). Bettyhill ! 109. Caithness : Thurso ! Scrabster ! 110. Outer Hebrides : Scarp (Duncan). Harris (K. B. Blackburn). 111. Orkney : Hoy (Fortescue and Johnston) (form with remarkably glabrous foliage).

Ireland.—2. N. Kerry : Ross Island (Scully). Killarney (Linton). 9. Clare : Ballyvaughan ! 16. W. Galway : Bennabola (Backhouse). Kylemore (Hart). 17. N.E. Galway : Tuam (Praeger). 26. E. Mayo : Lough Mask (Praeger). 27. W. Mayo : Laghtaoughter (Knowles). 28. Sligo : Glencar (Hanbury). Gleniff (Thistleton-Dyer). 29. Leitrim : Glenade (Praeger). 33. Fermanagh : Erne (Hart). 35. W. Donegal : Glenties (Hart). 39. Antrim : Garron Point (Shoolbred). Glenariff (Stewart). 40. Londonderry : Benevenagh (Stewart).

Endemic.

44. *HIERACIUM SCARPICUM* Pugsley in Journ. Bot. lxxix. 180 (1941).

Ersicc.—W. S. Duncan, Scarp, off Harris, 1890, 1891 (type) and 1894, in Hb. Mus. Brit. (ex Hb. A. Bennett).

Caulis 10–35 cm., *vix robustus*, pilis longis (–6 mm.) undulatis dense hirsutus (praesertim basin versus), superne ± floccosus. *Folia* papyracea, laete viridia inferne glaucescentia, *radicalia* (pauca) plurima relative magna, *ovalia ad lanceolata*, obtusomucronata ad acuta, dentibus apiculatis ± *grosse serrato-dentata*, in petiolum longum sensim attenuata; *caulina* (2–) 3–4, *magna*, infimum lanceolatum, acutum, subpetiolatum, praesertim basin versus acute et grosse dentatum vel etiam laciniatum, medium ovato-lanceolatum ad lanceolatum vel subdeltoideum, saepe breviter subpetiolatum, acuminatum, dentibus longis acuminatis patulis interdum ± jaculiforme, suprema minora, lanceolata, ± acute dentata; omnia *superne* ± *glabra*, *inferne*, saltem in costâ dorsali, *pilosa*, marginibus longe ciliatis petiolisque villosis. *Anthela subcorymbosa*, 2–6 capitulis magnis et *pedunculis breviusculis* floccosis pilis patulis hinc inde glandulis nonnullis immixtis obtectis. *Involuta vix lata*, inferne rotundata. *Squamae* (exteriores laxae) in gemmis incumbentes, *obscure virides*, longae, lineari-lanceolatae, subacutae, floccosae (praesertim in marginibus), ± *dense et longe pilosae*, vulgo eglandulosae. Ligulae luteae apice breviter pilosae. Styli lividi. Alveoli receptaculi margine valde dentato-fimbriati.

Stem 10–35 cm. high, *scarcely robust*, pilose (densely so below) with long (–6 mm.), waved hairs and ± floccose above. *Leaves* thin, light green, glaucescent beneath, the *radical* generally few; the primordial subrotund to oval, rounded-obtuse-mucronate, denticulate to serrate, and shortly narrowed below to winged petioles; the later relatively large, *oval to lanceolate*, obtuse-mucronate to acute, ± *coarsely serrate-dentate* with apiculate teeth, and attenuate below to ± long petioles; *stem-leaves* (2–) 3–4, *large*, the lowest lanceolate, acute, subpetiolate, with sharp, coarse teeth (sometimes laciniate) especially towards the base, the second lanceolate or ovate-lanceolate to subdeltoid, often shortly subpetiolate, acuminate, with long, spreading, acuminate teeth, sometimes forming a truncate-jaculiform base, the uppermost smaller, lanceolate, ± sharply toothed; all ± *glabrous above* and pilose, at least on the midrib, beneath, with the margins ciliate with long pilose hairs and villous petioles. *Inflorescence subcorymbose*, 2–6-headed, with rather short *peduncles*, which are floccose with spreading pilose and occasionally some glandular hairs. *Heads* large, *scarcely broad*, rounded below. *Phylluries* incumbent in bud, the outer lax, *dark green*, long, linear-lanceolate, subacute, floccose chiefly on the margins, ± *densely long-pilose* and generally eglandular. Ligules full yellow, shortly pilose-tipped. Styles livid. Margins of receptacle-pits strongly dentate-fimbriate. Achenes blackish, 4–4.5 mm. long.

This hawkweed, which was collected by W. S. Duncan in the North Bay of Scarp, a small island west of Harris, in the Outer Hebrides, was found, unnamed, in the herbarium of the late Arthur Bennett (now in Herb. Mus. Brit.), where it is represented by thirteen specimens collected in three different years. The plant evidently belongs to the Section *Cerinthoidea*, as is shown by the long-pilose stem and

foliage, the large heads with pilose-tipped ligules, the dark styles and the ciliate alveoles ; and of this group it seems to be most nearly allied to *H. iricum* Fr., of which there are also typical specimens from Scarp in Herb. A. Bennett, obtained by the same collector. In the 'Annals of Scottish Natural History', p. 244 (1895), Bennett wrote of these plants, '*H. iricum* Fr.—Very typical and abundant in Scarp, W. S. Duncan sp. Some specimens from Scarp Mr. Hanbury would place under *iricum* as an abnormal form. I am quite unable to see their affinity with *iricum*, and have seen nothing exactly like them from any part of Britain'. The abnormal plant thus referred to, which is now described, differs from *H. iricum* in its dwarfer and less robust habit, its large, subpetiolate, sometimes almost laciniate cauline leaves, its less glandular inflorescence and its smaller and much narrower heads. A comparison with the original descriptions and diagrams of the species of this Section described by Dahlstedt in Warming's 'Botany of the Faeroes' (1903), and with the later account in Ostenfeld and Grøntved's Flora, shows that it differs also in some features from all of these plants, although two of them, *H. veterascens* Dahlst. and *H. peramplum* Dahlst., bear some resemblance to it. In view of this, and as the plant seems to be adequately represented by exsiccateae collected in different years, there is no ground for regarding it as an abnormal state of *H. iricum*, and it is therefore described as a new species, *H. scarpicum*. In 1939 it was discovered also in the Uig district of Lewis, and in 1940 on Little Bernera.

Distribution.—110. Outer Hebrides : Scarp, Harris (Duncan). Uig, Lewis (Wilmott). Little Bernera, Lewis (W. A. Clark).

Endemic.

Sect. V. OREADEA.

Fries, Epier. 82 (1862) ; W. R. Lint. Brit. Hier. 3 (1905), ex parte ; *Pulmonaroidea* Subsect. *Oreadea* Rouy Fl. Fr. ix. 316 (1905) ; *Oreadea*, *Oreadea-Vulgata* and *Oreadea-Bifida* Zahn, l. c. 212, 231 and 260 (1921), partim.

Scapigerous or cauligerous plants of robust or slender habit, with \pm glaucous, sometimes purple-spotted foliage (except *H. nitidum*). Radical leaves narrowed below (or rounded in *H. lima*, *H. lasiophyllum* and *H. eustomon*) ; cauline never semi-amplexicaul (unless in *H. orimeles* var. *argentatum*). Leaves normally clothed on the margins, and sometimes on the upper or both surfaces, with \pm long, rigid, simple hairs (setae) resembling those of *H. Pilosella*. Inflorescence \pm furcate-corymbose. Heads of moderate size to large, with phyllaries porrect in bud (unless in *H. scoticum* and *H. orimeles*), and less strongly pilose than in the Sections *Alpina* and *Cerinthoidea*. Ligules with glabrous or rarely pilose tips. Styles usually yellow (except in *H. carneddorum*). Margins of receptacle-pits subulate-dentate, occasionally \pm fimbriate.

Flowering May–July, and often later.

This group was based by Fries on his scapigerous species, *H. rupicolum*, which is closely allied to *H. Schmidtii* Tausch. The principal group-character is the presence of rigid, often bulbous-based, simple pilose hairs or setae on the margins and upper side (or at least the former) of the generally glaucescent and cuneate-based foliage. When these setae are obsolete in shade or other special conditions they are generally not replaced by softer hairs and the leaves become more or less glabrous. A furcate-corymbose inflorescence with relatively few heads of yellow-styled florets, with porrect phyllaries, is another general feature.

According to Zahn, Oreadean species are found throughout Europe, as well as in Asia Minor and Syria. In Great Britain they occur in rocky districts, rarely at a

high altitude, from Devon and Somerset through Wales and Northern England to the extreme north of Scotland, as well as Orkney and Shetland. They are absent from Central and South-eastern England. A few species are scattered over the whole of Ireland.

Most of these plants are easily cultivated, but they do not often prove attractive in the garden.

Series *Pallida* [Grex *H. pallidum* Biv.-Bern.].

Scapigerous plants with numerous \pm oval basal, and normally 0-1(-2) stem-leaves, generally placed high on the stem.

- * Leaves little toothed, rounded or subtruncate below, setose on margins and upper surface. Heads of \pm moderate size.

Leaves \pm broadly oval, obtuse, with stiff, curved setae. Heads rather large. *H. lima*.
Leaves oblong, very obtuse, with long, straight or waved setae. Heads smaller *H. lasiophyllum*.

- ** Leaves more toothed, setose chiefly on the margins. Heads \pm large.

Leaves broad, rounded below. Heads large (smaller in var. *devoniense*)..... *H. eustomon*.
Leaves narrower, cuneate-based. Heads rather large. (Stem-leaves 2-3 in var. *crinigerum*.) *H. Schmidtii*.
Leaves less cuneate-based and setose, sometimes marked with purple. Heads rather large, with narrow phyllaries *H. Leyi*.

Series *Argentea* [Grex *H. argenteum* Fr.].

Scapigerous plants resembling *Oreadea*, ser. *Pallida*, but with narrow, \pm lanceolate leaves, attenuate below and with less setiform hair-clothing.

- * Leaves green or purple-spotted. Plants \pm slender.

Leaves bright green, serrate. Heads typically rather large, rounded below, with dark, \pm obtuse phyllaries *H. nitidum*.
Leaves spotted, sharply serrate. Heads of medium size, subtruncate-based, with broad, obtuse phyllaries *H. basicrinum*.
Leaves \pm spotted, denticulate (broad-based in var. *subtruncatum*). Heads of medium size, subtruncate-based, with dark, acute phyllaries. Plant slender *H. Sommerfeltii*.
Leaves spotted, finely dentate. Heads rather large, truncate-based, with dark, obtuse phyllaries. Ligules pilose-tipped. Styles \pm livid *H. carneddorum*.

- ** Leaves \pm glaucous. Plants slender.

Leaves \pm dentate, the cauline 2, narrow, spreading. Heads of medium size (or large in var. *subglabratum*), truncate-based, with dark green phyllaries *H. argenteum*.
Leaves very narrow, deeply toothed or sub-pinnatifid. Heads rather large, rounded below, with dark green phyllaries *H. vagense*.
Leaves very narrow, sharply toothed or laciniate, subglabrous. Heads of medium size, rounded below, with grey-green phyllaries. Ligules light yellow *H. cambricum*.

Series *Eu-Oreadea* [Grex *H. oreades* Fr.].

Phyllopodous or hypophyllopodous cauligerous plants, with fewer basal and 2-several stem-leaves; setiform hairs usually clothing the upper leaf-surface.

- * Phyllopodous plants; leaves sharply toothed, with \pm coarse setae.

Leaves \pm elliptic, usually small, purple-spotted; cauline 2-4. Heads of medium size, subtruncate-based *H. Griffithii*.
Leaves \pm oval, larger, with coarse and long setae; cauline 2-3. Heads rather large, truncate-based *H. deganwyense*.
Leaves long, \pm lanceolate, with weaker setae; cauline 1-5. Heads rather large, truncate-based *H. buglossoides*.

** Normally hypophyllopodous plants, with less coarsely setose foliage.

- Leaves elliptic, with sharp teeth ; cauline 3-6 (phyllopodous in var. *rosulare*).
 Heads large, subtruncate-based, with sub-incumbent phyllaries. *H. scoticum*.
 Leaves narrowly oblong, subentire ; cauline 2-4. Heads of medium size,
 rounded below, with greenish-yellow ligules. *H. chloranthum*.
 Leaves oval-lanceolate, with \pm recurved teeth ; cauline usually 2. Heads
 rather large, subtruncate-based *H. Beebyanum*.
 Leaves oval-lanceolate, denticulate ; cauline 3-5 (glabrate with setose
 margins and semi-amplexicaul stem-leaves in var. *argentatum*). Heads
 of medium size, subtruncate-based *H. orimeles*.

Series **Pallida** (See page 83.)

45. *HIERACIUM LIMA* F. J. Hanbury in Journ. Bot. xxx. 206 (1892) ; in Bab. Man. ed. 9, 242 (1904) ; W. R. Lint. Brit. Hier. 22 (1905) ; *H. pallidum* subsp. *lima* Zahn, l. c. 220 (1921).

Exsicc.—Linton no. 82 ; Ley, Cheddar, 1906 ; Marshall no. 3969 ; all in Hb. Mus. Brit.

Stem 15-40(-50, cult.) cm. high, erect, pilose below, floccose with a few black-based pilose and small glandular hairs above. *Radical leaves* rather thick, deep glaucous green, paler or purple-tinted beneath ; the primordial obovate or broadly oval, apiculate, subentire ; the later \pm broadly oval, obtuse, apiculate, subentire or distantly denticulate, the innermost often ovate-lanceolate, subacute, with a few coarse, spreading teeth below (leaves sometimes longer and more acute in cultivation), rounded at the base ; stem-leaf 0 or 1, oblong-lanceolate, \pm dentate, subpetiolate ; all rough above with stiff, curved setae and densely pilose on the lower surface, margins and petioles. Inflorescence furcate-subcorymbose, 1-10(-15, cult.)-headed, often with one long lower branch, the peduncles straight or arcuate, floccose with numerous fine glandular and a few pilose hairs. Heads rather large, rounded below. Phyllaries porrect in bud, dark green with paler margins, narrow linear-lanceolate, finely acuminate, floccose with many glandular and \pm numerous dark-based pilose hairs. Ligules light yellow, with glabrous tips. Styles yellow. Margins of receptacle-pits dentate-fimbriate. Achenes dark brown, 3.5-4 mm. long.

H. lima was regarded by Hanbury as a member of the Section *Cerinthoidea* and was transferred to the *Oreadea* by W. R. Linton. The light yellow ligules and the fimbriate alveoles indicate an affinity with the former group, but the furcate inflorescence, slightly pilose flower-heads, porrect phyllaries, glabrous-tipped ligules and yellow styles are Oreadean features, which, taken together, appear to justify Linton's transfer. The plant is allied to the Central European *H. candicans* Tausch.

H. lima seems to be confined to the limestone cliffs at Cheddar, in Somerset, where it was formerly abundant. It is an early-flowering species, often in bloom during May.

Distribution.—6. N. Somerset : Cheddar !

Endemic.

46. *HIERACIUM LASIOPHYLLUM* Koch, Syn. Fl. Germ. ed. 2, ii. 522 (1844) ; Backh. Mon. 45 (1856) ; Fries, Epicr. 85 (1862) ; Arvet-Touvet, Hier. Alp.-Franc. 67 (1888) ; Hanb. in Bab. Man. ed. 9, 244 (1904) ; W. R. Lint. Brit. Hier. 24 (1905) ; *H. cinerascens* Syme, E.B. ed. 3, v. 186 (1866), non Jord. ; *H. Schmidtii* f. *lasiophyllum* Williams, l. c. 109 (1902) ; *H. pallidum* subsp. *lasiophyllum* Zahn, l. c. 221 (1921).

Icon.—E.B. ed. 3, t. 841, as *H. cinerascens*.

Exsicc.—Linton no. 61 (Meal Slugain) ; Backhouse, Ben-a-Bourd 1855 ; Ley, Craig Breidden, 1907 ; Riddelsdell, Aberedw, 1909 ; all in Hb. Mus. Brit.

Stem 10–20(–40) cm. high, erect, \pm pilose and floccose throughout. *Radical leaves* rather thick, very glaucous, paler beneath; the primordial small, obovate to oval, obtuse, subentire, rounded below; the later *oblong* or rarely elliptic, *rounded-obtusely-mucronate*, *subentire*, remotely denticulate or with a few broad, shallow teeth about the rounded base (the innermost occasionally lanceolate, acute and cuneate-based); stem-leaf generally 0, if present, \pm lanceolate, acute and normally shortly petioled; all \pm clothed above with long, setose (often shining and very coarse) hairs (rarely glabrate—var. *semiglabrum* Arv.-Touv. l. c. 68), \pm pilose and floccose beneath, and \pm densely fringed with long pilose hairs which extend to the dilated base of the petioles. Inflorescence furcate-subcorymbose, 1–6-headed, the peduncles (sub-equalling or exceeding the accladium) floccose with many glandular and \pm numerous pilose hairs. *Heads of medium size*, rounded below. *Phyllaries* porrect in bud, greyish green, linear-lanceolate, acuminate, the outer rather lax and more obtuse, floccose (sometimes densely) with numerous dark glandular and dark-based pilose hairs. Ligules usually glabrous-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 3 mm. long.

β . euryodon Hanb. in Journ. Bot. xxx. 208 (1892); in Bab. Man. ed. 9, 245 (1904); W. R. Lint. Brit. Hier. 25 (1905); *H. pallidum* subsp. *lasiophyllum* var. *euryodon* Zahn, l. c. 221 (1921).

Exsicc.—Linton, Moncrieff Hill, Perth, 1888; Ley, Craig Du, 1893, and Craig Gledsiau, 1895; W. F. Miller, Abruchil, 1880; all in Hb. Mus. Brit.

Radical leaves more glabrous than in the type, narrower, oblong-lanceolate, subentire above and with broad, spreading, triangular teeth towards the base. Stem-leaf sometimes coarsely toothed. Phyllaries \pm incumbent in bud.

British examples of this species, which is well marked by its narrow but obtuse foliage, differ from the majority of Continental specimens by the presence of floccose hairs on the underside of the leaves. The characteristic coarse foliar setae are but few or sometimes wanting in some localities (var. *semiglabrum* Arv.-Touv.).

H. Leyi var. *vestitum* Ley ex Linton in Journ. Bot. xlix. 353 (1911) seems to be a form of *H. lasiophyllum*, judging from the exsiccata (W. R. Linton, Dollywaggon Pikes, 1905) in Herb. Linton (now in Herb. Mus. Brit.).

Distribution.—35. Monmouth (Ley). 36. Hereford: Great Doward (Riddelsdell). 40. Shropshire: Pontesbury Hill (Fraser). 42. Brecon: Clydach (Riddelsdell). 43. Radnor: Aberedw (Ley). 47. Montgomery: Craig Breidden (Borrer). 48. Merioneth: Barmouth! Blaenau Ffestiniog (Riddelsdell). 49. Carnarvon: Llanberis! Cwm Idwal (Griffiths). 66. Durham: Falcon Clints! (var. *semiglabrum* A.-T.). 70. Cumberland: Keswick! Borrowdale! 89. E. Perth: Denchra (McRitchie). Blairgowrie (Marshall). 90. Forfar: Glen Lee (Marshall). Clova (Backhouse). 92. S. Aberdeen: Ben-a-Bourd (Backhouse). Braemar! 98. Argyll: Kilmichael (Fisher).

Ireland.—38. Down: Spelga (Stewart). Rostrevor (Stewart). 40. Londonderry: Benevenagh (Stewart).

var. *euryodon*.

34. W. Gloucester: Symond's Yat (Riddelsdell). 41. Glamorgan: Aberdare and Craig-y-llyn (Riddelsdell). 42. Brecon: Craig Du and Craig Gledsiau (Ley). 57. Derby: Allport Edge (Linton). 65. N.W. Yorks: Cronkley (Cryer). 72. Dumfries: Moffat (Linton). 88. Mid Perth: Moncrieff Hill (Hanbury). 89. E. Perth: Killikrankie and Falls of Tummel (Buchanan-White). 90. Forfar: Maskeldie (Marshall). Glen Esk (Corstorphine). 92. S. Aberdeen: Little Craighindal!

General Distribution.—France. Central Europe to Roumania.

47. *HIERACIUM EUSTOMON* (Linton) Roffey in Lond. Cat. ed. 11 (1925).

H. Schmidtii var. *eustomon* Lint. in Journ. Bot. xxxi. 148 (1893); Hanb. in Bab. Man. ed. 9, 244 (1904); W. R. Lint. Brit. Hier. 24 (1905); *H. pallidum* subsp. *eustomon* Zahn, l. c. 216 (1921).

Exsicc.—Linton no. 130; Linton, Pennard Castle, 1885; Ley, Pwll Du, 1903, and Craig Gledsiau, 1906; all in Hb. Mus. Brit.

Stem 15–40(–50, cult.) cm. high, robust, pilose towards the base, nearly glabrous above. *Radical leaves* thick (unless in shade), glaucous; the primordial small, subrotund to obovate, very obtuse, subentire; the later (often rather large) *broadly oval* to elliptic (innermost occasionally lanceolate, acute), obtuse-mucronate to subacute, *denticulate* or the inner with a few sharp teeth below, *rounded below* or *shortly contracted* to a winged petiole; stem-leaf usually 1, ovate-lanceolate to lanceolate, sharply dentate below, or smaller and bractlike; occasionally a second, bractlike; all *setose on the margins* and sometimes on the upper surface, pilose beneath (chiefly about the midrib) and on the petioles. Inflorescence furcate- or racemose-corymbose, 1–6-headed, with straight, suberect peduncles, which are floccose with very few pilose or glandular hairs. *Heads large and handsome*, ovoid but truncate-based in fruit. *Phyllaries* porrect in bud, *dark green*, long, linear-lanceolate, \pm acute, sparingly floccose and senescent, with many black-based pilose hairs, almost eglandular. Ligules light yellow, glabrous-tipped. Styles yellow. Margins of receptacle-pits deeply subulate-dentate. Achenes blackish, 3.5–4.5 mm. long.

β . *devoniense* (Hanb.) comb. nov.

H. Schmidtii var. *devoniense* Hanb. in Journ. Bot. xxxii. 227 (1894); in Bab. Man. ed. 9, 244 (1904); W. R. Lint. Brit. Hier. 24 (1905); *H. pallidum* subsp. *devoniense* Zahn, l. c. 222 (1921).

Exsicc.—Linton no. 84 (Tutshill); Marshall no. 3092 (Minehead); both in Hb. Mus. Brit.

Leaves rather broader than in the type, the cauline often 2; inner radical and lowest cauline very variable in outline, sometimes jaculiform, with two long, spreading basal teeth. Heads generally rather smaller and greyer, with narrower, more floccose phyllaries, rarely stylose-flowered.

In cultivation *H. eustomon* often develops long branches from near the base of the stem with 2–3 cauline leaves. The radical leaves become narrower, the inner frequently long-lanceolate, with sharp, rather coarse teeth below; the cauline leaves are then long-lanceolate also, or the upper linear-lanceolate. At the same time the inflorescence becomes a loose panicle with 10–13 smaller heads, 2–3 on each of the long, lower branches. The variety *devoniense*, in my experience, undergoes less change when cultivated, and does not produce similar long lower branches and linear-lanceolate cauline leaves.

The thick, glaucous, round-based leaves, sometimes very irregularly toothed, of *H. eustomon* serve to distinguish it from *H. Schmidtii* Tausch, which always produces more or less serrate and cuneate-based foliage. The tendency of *H. eustomon* to develop a subcauligerous habit under cultivation, with more than one stem-leaf, is also distinctive. The exsiccata Linton no. 129, from Craig Gledsiau, sent out as *H. Leyi* F. J. Hanb., is *H. eustomon*.

Distribution.—41. Glamorgan: Pennard Castle! 42. Brecon: Beacons and Craig Gledsiau (Ley). 44. Carmarthen: Carmarthenshire Fan (Riddelsdell). 45. Pembroke: Tenby!

var. *devoniense*.

3. S. Devon: Hay Tor (Fraser). 4. N. Devon: Ilfracombe! Combe Martin & Woodabay! Lynmouth! 5. W. Somerset: Greenaleigh (Murray). 34. W. Gloucester. Tutshill (Shoolbred).

Endemic.

48. *HIERACIUM SCHMIDTII* Tausch in Flora, xi. Erg. Bl. i. 65 (1828); Williams, l. c. 109 (1902); Hanb. in Bab. Man. ed. 9, 244 (1904); W. R. Lint. Brit. Hier. 23 (1905); *H. pallidum* subsp. *Schmidtii* Zahn, l. c. 215 (1921).

Exsicc.—Linton no. 106 (Bettyhill); E. S. Salmon, Kinlochewe, 1896; Linton, Corriemulzie, 1899; all in Hb. Mus. Brit.

Stem 15–40(–50, cult.) cm. high, rather slender and flexuous, subglabrous or sparingly pilose below, slightly floccose with a few pilose and fine glandular hairs above. *Radical leaves* \pm glaucous; the primordial very small, rotundate to elliptic, obtuse-mucronate; the later *oval*, elliptic or lanceolate, the *outer obtuse-mucronate* and the *inner acute, subentire, denticulate or sharply serrate* below the middle with *ascending teeth* (subvar. *pluridentatum* Zahn), attenuate or shortly contracted to long pilose or setose petioles; stem-leaf usually 1, linear-lanceolate, sharply toothed and sessile, or smaller and bractlike; all \pm *setose* or pilose-setose on the margins and less so on both surfaces, occasionally nearly glabrous above, rarely sparingly floccose beneath. Inflorescence racemose-corymbose, 1–6-headed, with straight, suberect branches somewhat exceeding the accladium, the peduncles floccose with some pilose and \pm numerous fine glandular hairs. *Heads rather large*, rounded below. *Phyllaries* porrect in bud, *dark green*, linear-lanceolate, acute, sparingly floccose, with many black-based pilose and \pm numerous fine glandular hairs. Ligules glabrous- or shortly pilose-tipped. Styles yellow. Margins of receptacle-pits subulate-laciniate ap. W. R. Linton. Achenes nearly black, 3–3.5 mm. long.

β . *crinigerum* (Fries) Hanb. in Bab. Man. ed. 9, 244 (1904); W. R. Lint. Brit. Hier. 24 (1905); *H. pallidum* var. *crinigerum* Fr. Symb. 94 (1848); Epier. 84 (1862).

Exsicc.—Shoobred, Obe, S. Harris, 1894, in Hb. Mus. Brit.

Stem-leaves 2–3, decreasing upwards; lowest sessile, sharply serrate like the basal leaves, uppermost bractlike.

It is attempted here to limit the interpretation of *H. Schmidtii* Tausch in accordance with the views of Zahn, but even so the plants included show considerable variation. In some of the Scottish stations the species produces green foliage, while in the Nant Francon plant referred to it the leaves are intensely glaucous.

The variety *fealense* Beeby in Ann. Scot. Nat. Hist. 112 (1908), described as 'Leaves narrower, margins setose; heads with numerous glands', seems from the authentic Shetland specimens in Herb. Beeby (nos. 1045 and 1100) to differ from the ordinary form only by the possession of two cauline leaves and predominantly glandular heads. The leaves of these specimens are elliptic-lanceolate with denticulate margins.

There are Irish exsiccatae in Herb. Hanbury, referred to *H. Schmidtii*, which need further investigation. One form was collected by Hart at Ballyshannon, Co. Donegal, and in the Erne Estuary; this has rather broad, serrate foliage that lacks the Oreadean setae, and its styles are apparently fuscous. Another, found by Hanbury on Slieve League, in the same county, differs in its shallowly sinuate-dentate leaves and broad phyllaries.

No specimens have been traced of *H. dentifex* Lint. in Journ. Bot. xlix. 354 (1911), which seems to be a green-leaved form or ally of *H. Schmidtii*.

Distribution.—41. Glamorgan: Craig-y-llyn (Riddelsdell). 49. Carnarvon: Nant Francon! 65. N.W. Yorks: Cronkley Scar (Backhouse). 66. Durham: Cauldron Snout (Borrer). 80. Roxburgh: Yetholm and Cheviots (Brotherston). 87. Clackmannan: Glen of Sorrow (Drummond). 89. E. Perth: Glen Shee (Linton). Pitlochry! 90. Forfar: Clova! 92. S. Aberdeen: Braemar (Hanbury). 100. Clyde Is.: Machrie Bay, Arran (Somerville). 105. W. Ross: Kinlochewe (E. S. Salmon). 106. E. Ross: Strathpeffer (Mennell). 108. W. Sutherland: Bettyhill! 109. Caithness: Berriedale (Linton). 110. Outer Hebrides: Scarp (Duncan). Clisham, Harris (Shoobred). 112. Shetland: Feala (Beeby).

Ireland.—4. Mid Cork : Carrigrohane (Phillips). 17. N.E. Galway : Menloo (Praeger). 34. E. Donegal : Innishowen (Hart).

var. *crinigerum*.

68. Cheviotland : Alwinton and Windyhaugh (Oliver). 91. Kincardine : St. Cyrus (Buchanan-White). 110. Outer Hebrides : Obe, Harris (Shoolbred). Scarp (Duncan).

General Distribution.—Spain, France, Switzerland ! Germany, Scandinavia.

49. *HIERACIUM LEYI* F. J. Hanbury in Journ. Bot. xxxii. 226 (1894) ; in Bab. Man. ed. 9, 243 (1904) ; W. R. Lint. Brit. Hier. 23 (1905) ; *H. anglicum* var. *brevifurcatum* Williams, l. c. 95 (1902) ; *H. pallidum* subsp. *Leyi* Zahn, l. c. 221 (1921).

Icon.—Pl. 3, fig. a.

Ersicc.—Ley, Llyn Duly, 1887, and Ysgolion Duon, 1904 ; Marshall no. 3723 ; all in Hb. Mus. Brit.

Stem 15–30(–50, cult.) cm. high, rather slender and flexuous, striate, nearly glabrous but ±floccose above. *Radical leaves* ascending, rather coriaceous, dull bluish green *sometimes clouded with purple* ; the primordial small, obovate or oval, mucronulate ; the later *oblong*, obtuse-mucronate (or the innermost oblong-lanceolate, acute), *subentire or distantly denticulate*, or the inner with a few sharp, generally ascending teeth towards the base or rarely extending to the petiole (in cultivation more lanceolate and acute), *shortly contracted below* ; stem-leaf 0–1, sometimes well-developed, ovate-lanceolate, petiolate, with some sharp basal teeth, sometimes smaller and more bractlike ; all except the primordial becoming *subglabrous above*, ±*pilose beneath and on the margins* (the marginal hairs often ±setose), and long-pilose on the petioles ; stem-leaf ±floccose beneath. Inflorescence furcate-corymbose, 1–4(–7)-headed, with slender, curved branches usually subequalling the accladium ; peduncles floccose with numerous fine glandular and a few pilose hairs. *Heads rather large*, rounded below. *Phyllaries* porrect in bud, *dark green, narrowly linear-lanceolate*, attenuate, acute, the outer linear and lax, floccose (chiefly on the margins) with many dark glandular and black-based pilose hairs. Ligules glabrous-tipped. Styles yellowish. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

H. Leyi differs from *H. Schmidii* chiefly in its dull, bluish green, less serrate foliage, and its very narrow, lax phyllaries. The species, which was founded on a Welsh plant, appears to be confined to North Wales, the North of England and Berwickshire. The specimens so named from the Scottish Highlands are referable to *H. Jovimontis* (Zahn). The variety *vestitum* Ley ex Linton in Journ. Bot. xlix. 353 (1911), has been noticed under *H. lasiophyllum*.

H. saxifragum Fr. subsp. *Pseudo-Leyi* Zahn, l. c. 251, is ostensibly founded on a cultivated form (origin, Ysgolion Duon) sent out by the Lintons as *H. Leyi* under the number 128 of their set of exsiccatae, Zahn remarking, ‘Ab *H. Leyi* omnino diversum’. As in some other cases, a mixture was sent out under this number, some specimens being *H. Leyi*, and others, presumably including those seen by Zahn, a cultivated form of *H. decolor* Ley. Zahn’s description of subsp. *Pseudo-Leyi* might be applied to the Great Orme’s Head form of *H. decolor* (q.v.).

The *Pilosellae majoris seu Pulmonariae luteae species magis laciniata* of Ray’s Synopsis, 45 (1690), ‘saxis grandioribus et collapsis rupibus vallis Perisianae’, is probably this species.

Distribution.—47. Montgomery : Craig Breidden (Melvill). 49. Carnarvon : Cwm Idwal ! Snowdon, etc. ! 65. N.W. Yorks : Cautley Spout (Ley). 68. Cheviotland : Spindlestone Hills (Richardson). 69. Westmorland : High Street (Ley). 81. Berwick : Sweethope Crags (Hutmacher).

Endemic.

Series **Argentea** (See page 83.)

50. *HIERACIUM NITIDUM* Backhouse, Mon. 50 (1856); Williams, l. c. 119 (1902); Hanb. in Bab. Mon. ed. 9, 247 (1904); W. R. Lint. Brit. Hier. 26 (1905); *H. saxifragum* subsp. *nitidum* Zahn, l. c. 253 (1921).

Icon.—Eng. Bot. ed. 3, t. 844.

Exsicc.—Backhouse, Cairntoul, 1855; Linton no. 86 (Bettyhill and Ben-a-Bourd); Marshall no. 3429; all in Hb. Mus. Brit.

Stem erect, 20–40 cm. high, fairly robust, sparingly pilose, slightly floccose above. *Radical leaves narrow, bright green*; the primordial small, oval, rounded-obtus mucronate, denticulate, abruptly narrowed below; the later *oblong-lanceolate* to lanceolate, acute to acuminate, distantly *denticulate* to *sharply serrate* with ascending teeth (especially towards the base), \pm cuneate-based; *stem-leaf generally* 1, sometimes placed low, shortly petioled and resembling the inner basal, sometimes smaller, spreading, with a few sharp teeth, or subentire and bractlike; all *pilose* on both surfaces (or glabrescent above) and on the margins, with \pm short, villous petioles; the under surface of the inner basal and the stem-leaves sometimes \pm floccose. Inflorescence compactly furcate-corymbose, 2–7-headed, with slender, straight lateral branches generally exceeding the accladium, the peduncles \pm floccose with many dark glandular and some pilose hairs. *Heads rather large*, rounded below. *Phyllaries* (porrect) in bud, *dark green*, rather broad, linear-lanceolate, obtuse except the innermost, the outer rather lax, sparingly floccose, with many dark-based pilose and \pm fine glandular hairs. Ligules slightly pilose-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

β . siluriense Hanb. in Journ. Bot. xxxii. 228 (1894); in Bab. Man. ed. 9, 247 (1904); Williams, l. c. 114 (1902); W. R. Lint. Brit. Hier. 26 (1905).

Exsicc.—Linton no. 163 (Brecon); Ley, Brecon Beacons, 1900; Riddelsdell, Craig Gledsiau, 1898 and 1902; Ley, Glen Collwng, 1908; all in Hb. Mus. Brit.

Stem slenderer than in the type, flexuous and more glabrescent. Radical leaves glaucescent, usually finely serrate; stem-leaf generally well developed. Peduncles with long, spreading pilose hairs, generally eglandular. Heads of medium size; phyllaries broader and darker than in the type, with \pm numerous dark pilose hairs, glandular hairs often wanting. Ligule-tips glabrous.

γ . carenorum (Hanb.) comb. nov.

H. carenorum Hanb. in Journ. Bot. xxxii. 227 (1894); in Bab. Man. ed. 9, 244 (1904); W. R. Lint. Brit. Hier. 27 (1905); *H. saxifragum* subsp. *carenorum* Zahn, l. c. 250 (1921).

Exsicc.—Hanbury, Cashel Dhu, 1888 (type), in Hb. Hanbury.

Leaves pale green, denticulate or with fine, sharp, ascending teeth (even in cultivation). Peduncles floccose with numerous fine glandular and some scattered pale pilose hairs. Heads of medium size; phyllaries dull green, senescent. Otherwise like the type.

H. nitidum is a rather scarce plant of the Cairngorms and northern Scottish hills, somewhat intermediate between *H. Schmidtii* and *H. argenteum* Fr. but with bright green foliage. The Welsh variety *siluriense* is distinguishable by its slenderer growth and well-developed stem-leaf, but otherwise strongly resembles the typical species. It might, however, be regarded as specifically separable. The variety *carenorum* seems to be a rare form, represented in Herb. Hanbury by a single original sheet, with some cultivated examples. The original sheet was first labelled '*H. nitidum* Backh.' by Hanbury, although this is not indicated in the subsequent descriptions. The specimen apparently differs from *H. nitidum* only in its paler, less deeply cut foliage and its smaller, paler heads; and it is therefore reduced to a variety. In

the parcel of *H. nitidum* in Herb. Hanbury there is another specimen from Bettyhill with the exact foliage of *H. carenorum* and heads of intermediate form.

H. carenorum was issued in Messrs. Linton's set of exsiccatae under no. 83, the specimens being supplied by Marshall from Coalbackie, near Tongue, in Sutherland in 1897. The name was afterwards corrected by Linton to 'a form between *H. Schmidtii* and *H. argenteum*, coming very near *H. argenteum* var. *septrionale* F. J. H. (see No. 133).' The specimens of this set now in Herb. Mus. Brit. closely resemble var. *septrionale*.

Distribution.—90. Forfar : Clova (Marshall). Glen Dole (Corstorphine). 92. S. Aberdeen : Cairntoul (Backhouse). Braemar! 97. W. Inverness : Aonach Mor (Druce). 106. E. Ross : Altguish (Marshall). 107. E. Sutherland : Ben More (Marshall). 108. W. Sutherland : Allt-na-Caillich (Hanbury). Tongue and Bettyhill (Marshall). 110. Outer Hebrides : Scarp (Duncan). Clisham (Shoolbred).

var. *siluriense*.

41. Glamorgan : Craig-y-llyn (Ley). 42. Brecon : Craig Gledsiau, Glen Collwng, etc. (Ley). 44. Carmarthen : Fanfechan (Riddelsdell).

var. *carenorum*.

108. W. Sutherland : Cashel Dhu, Ben Hope (Hanbury).

Endemic.

51. *HIERACIUM BASICRINUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925); *H. praecox* subsp. *basicrinum* Zahn, l. c. 234 (1921); *H. Sommerfeltii* var. *tactum* Hanb. in Journ. Bot. xxx. 367 (1892); in Bab. Man. ed. 9, 248 (1904); W. R. Lint. Brit. Hier. 28 (1905).

Exsicc.—Hanbury, Kingshouse, in Hb. Hanbury, as *H. Sommerfeltii* var. *tactum*.

Stem 10–30 (–45, cult.) cm. high, *rather slender*, with scattered pilose hairs, chiefly below, becoming floccose upwards with a few fine glandular hairs. *Radical leaves pale green*, much *spotted* with reddish brown; the primordial oval or oblong, rounded-obtuse-mucronate, subentire, shortly contracted below; the later *oblong* to oblong-lanceolate, obtuse-mucronate to acute, *denticulate* to \pm regularly *serrate-dentate* with fine, sharp, spreading teeth, all cuneate-based; *stem-leaves* 0–2, the lower resembling the inner basal but smaller and subpetiolate, the upper, if present, linear, subentire; all glabrescent above and pilose beneath, with a fringe of \pm setiform hairs and long, villous petioles, the stem-leaves also \pm floccose beneath. Inflorescence furcate- or racemose-corymbose, 1–5-headed, with suberect peduncles, which are floccose with scattered, fine, dark glandular and very few pilose hairs. *Heads of medium size*, *subtruncate-based*. *Phyllaries* (porrect) in bud, *dark grey-green*, broad, linear-lanceolate, mostly *obtuse*, floccose chiefly towards the base, senescent, with many dark-based pilose and shorter, fine glandular hairs. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits incise-dentate. Achenes blackish, about 3.5 mm. long.

This rare plant was originally described by Hanbury as a variety of *H. Sommerfeltii* Lindbg., but is distinguishable, as he pointed out, in several particulars. Its serrate foliage is brightly spotted and furnished with regular, sharp, spreading teeth, which become enlarged under cultivation; and the heads, though subtruncate-based as in *H. Sommerfeltii*, are quite distinct owing to their broad, obtuse and more floccose phyllaries. It is here treated as a separate species under Zahn's subspecific name. Specimens were issued as no. 108 of Linton's set, but the sheets seen show cultivated material only, which is not very typical.

On the page of his Monograph (234) dealing with *H. basicrinum* Zahn shows another species of the same group, *H. bounophilum* Jord. ex Bor. Fl. Centre, ed. 3, i. 412, as occurring in 'England'. Nothing is known of this as a British plant.

Distribution.—94. W. Inverness : Moidart (Macvicar). Aonach Mor (Marshall). 98. Argyll : Kingshouse (Hanbury).

Endemic.

52. *HIERACIUM SOMMERFELTII* Lindeberg, Hier. Scand. Exsicc. ii. 66 (1872) ; Bot. Not. 118 (1872) ; Williams, l. c. 115 (1902) ; Hanb. in Bab. Man. ed. 9, 247 (1904) ; W. R. Lint. Brit. Hier. 28 (1905) ; *H. Sommerfeltii* subsp. *Sommerfeltii* Zahn, l. c. 272 (1921).

Icon.—Zahn, l. c. fig. 24.

Exsicc.—Linton no. 34 (Stob Garbh) ; Marshall nos. 3065, 3973 ; all in Hb. Mus. Brit.

Stem 10–35 cm. high, *slender*, glabrescent or with scattered pilose hairs towards the base. *Radical leaves* few, *pale green*, \pm marked with *purplish blotches* ; the primordial oval, rounded-obtuse-mucronate, denticulate, cuneate-based ; the later *oblong* to lanceolate, obtuse-mucronate to acute, *glandular-denticulate* or serrulate, attenuate below to slender petioles ; *stem-leaf usually* 1, sometimes placed low and resembling the inner basal but more sharply toothed, sometimes higher and lanceolate, subentire, or small and bractlike ; all \pm *glabrous above*, pilose (and typically floccose) beneath, with *pilose-ciliate margins* and villous petioles. Inflorescence compact, furcate-corymbose, 1–2(–4)-headed, with slender peduncles, which are floccose with scattered fine glandular and sometimes pilose hairs. *Heads of medium size, subtruncate-based*. *Phyllaries* porrect in bud with spreading tips, *dark green*, linear-lanceolate, \pm *acute*, sparingly floccose and senescent, with \pm numerous pilose and fewer fine glandular hairs. Ligules glabrous-tipped. Styles typically fuscous, but sometimes yellow. Margins of receptacle-pits incise-dentate ap. Zahn. Achenes blackish, 3.5–4 mm. long.

β . *subtruncatum* var. nov.

Exsicc.—Marshall no. 3072 (type) ; Linton, Little Craigindal, 1889 ; both in Hb. Mus. Brit.

Folia radicalia (primariis exceptis) plerumque ovato-lanceolata basi subtruncata, infra medium dentibus infimis horizontalibus vel etiam deflexis \pm sinuato-dentata. Styli lutei. Aliter ut in typo.

Leaves, except the primordial, mostly ovate-lanceolate with subtruncate base, \pm sinuate-dentate in the lower half with the lowest teeth horizontal or even deflexed. Styles yellow. Otherwise like the type.

H. Sommerfeltii has a wide distribution in the Scottish Highlands though it is by no means a common plant. Its small, slender habit with narrow, little toothed leaves, and compact inflorescence of few, subtruncate-based heads with dark phyllaries, is characteristic. In the variety *subtruncatum* the form of the foliage is widely different, but in other respects the plant is precisely similar to typical *H. Sommerfeltii*. Another variety, *setosum* Lint. in Journ. Bot. xlix. 354 (1911), has unspotted, more dentate and more setose foliage, with more developed stem-leaves. Of this plant no material has been traced.

Distribution.—69. Westmorland : Dove Craggs ! 72. Dumfries : Moffat (Davidson). 88. Mid Perth : Meal Ghaordie (Groves). Stob Garbh (Marshall). 89. E. Perth : Glen Shee and Glen Thailneiche (Marshall). 90. Forfar : Clova (Linton). 92. S. Aberdeen : Braemar ! Cairntoul (Hanbury). 96. E. Inverness : Glen Eunach (Groves). 97. W. Inverness : Coire an Easain Mor (Shoolbred). 98. Argyll : Ben Chaisteil (Marshall). 104. N. Ebudes : Uig, Skye (Linton). 108. W. Sutherland : The Mount (Miss Todd). 109. Caithness : Dunbeath (Hanbury).

Ireland.—35. W. Donegal : Fanet (Hart).

var. *subtruncatum*.

90. Forfar : Canlochen (Hanbury). Glen Esk (Corstorphine). 92. S. Aberdeen : Braemar ! Little Craigindal !

General Distribution.—Norway.

53. *HIERACIUM CARNEDDORUM* Pugsley in Journ. Bot. lxxix. 180 (1941) ; *H. Sommerfeltii* var. *splendens* Hanb. in Report B.E.C. 554 (1897) ; in Bab. Man. ed. 9, 248 (1904) ; Williams, l. c. 115 (1902) ; W. R. Lint. Brit. Hier. 28 (1905) ; *H. Sommerfeltii*, subsp. *Sommerfeltii* var. *Griffithii* sub-var. *splendens* Zahn, l. c. 272 (1921) ; non *H. splendens* Elfstrand (1890).

Exsicc.—Hanbury, Carnedd Dafydd, 1891 (type), in Hb. Hanbury ; Linton no. 134 (Carnedd Dafydd) ; Ley, Craig Dulyn, 1888 ; Linton, Cwm Idwal, 1890 ; all in Hb. Mus. Brit.

Stem 15–30(–40, cult.) cm. high, *slender*, pilose with long, spreading hairs and floccose above. *Radical leaves glaucous green, strongly blotched* with dark purple ; the primordial oval-oblong, rounded-obtuse-mucronulate, subentire, abruptly contracted below ; the later *oblong to lanceolate*, acute, *glandular-denticulate or finely dentate* with \pm spreading teeth (the innermost sharply serrate-dentate in luxuriant, cultivated specimens), attenuate below (very rarely subtruncate) to short or slender petioles ; *stem-leaf generally* 1(–3, cult.), narrow-lanceolate, subentire (or sharply serrate when cultivated) ; all normally *glabrescent above*, pilose (and the cauline also \pm floccose) beneath, *with margins fringed with \pm setiform hairs* and villous petioles. Inflorescence furcate-corymbose, 1–3(–6, cult.)-headed, with slender peduncles, which are floccose with \pm numerous, long, dark, spreading pilose and some shorter glandular hairs. *Heads rather large, truncate-based*. *Phyllaries* porrect in bud ap. W. R. Linton, *dark green*, rather broad, linear-lanceolate, *obtuse*, sparingly floccose, *densely pilose* with dark-based hairs, with a few fine glandular hairs intermixed. *Ligules strongly pilose-tipped*. *Styles \pm livid*. Margins of receptacle-pits incise-dentate. Achenes blackish, about 3.5 mm. long.

This species, confused with *H. Griffithii* Hanb. in W. R. Linton's 'British Hieracia', seems also to have been erroneously associated with *H. Sommerfeltii*. Specimens were sent by Linton to Dahlstedt, who remarked on them : 'Is not *H. Sommerfeltii* but a good form of *H. oreadeu* allied to some forms of *H. Schmidtii* from W. coast of Norway'. The plant differs from *H. Sommerfeltii* in its more strongly spotted foliage, its pilose inflorescence, its pilose-tipped ligules and its \pm livid styles ; and it appears distinct from all other known British forms. The specific epithet is adopted in allusion to its headquarters lying around the two Welsh Carnedds Llewellyn and Dafydd.

Distribution.—47. Montgomery : Craig Breidden (Salmon). 48. Merioneth : Llanwchyllyn (Ley). 49. Carnarvon : Craig Dulyn (Ley). Nant Francon ! Ysgolion Duon ! Cwm-glas-fach and Cwm Meillionen (Ley). Llanberis !

Endemic.

54. *HIERACIUM ARGENTEUM* Fries, Symb. 99 (1848) ; Epicr. 86 (1862) ; Backh. Mon. 49 (1856) ; Williams, l. c. 114 (1902) ; Hanb. in Bab. Man. ed. 9, 247 (1904) ; W. R. Lint. Brit. Hier. 27 (1905) ; *H. saxifragum* subsp. *argenteum* Zahn, l. c. 252 (1921) ; *H. pallidum* β *persicifolium* Bab. Man. ed. 5, 204 (1862) ; *H. pseudo-microdon* Dahlst. in Johnston, Add. Fl. Orkney, xiii. 5–6, in Trans. Bot. Soc. Edin. (1929).

Icon.—Eng. Bot. ed. 3, t. 843.

Exsicc.—Backhouse, Glen Fiagh, 1855; Linton no. 13; Groves, Glen Eunach, 1884; Marshall, Cwm Ffynnon Loer, 1912; all in Hb. Mus. Brit.

Stem 15–40 cm. high, *slender*, nearly glabrous with some scattered pilose hairs near the base. *Radical leaves* spreading, *glaucous* and paler beneath, rarely clouded with purplish; the primordial small, obovate to oval, obtuse-mucronate, subentire or remotely denticulate; the later (rarely numerous) \pm long, *lanceolate* or linear-lanceolate, \pm acute, *subentire* or remotely denticulate to *sinuate-dentate* (rarely lacinate in luxuriant plants), gradually attenuate below to relatively short, winged petioles; *stem-leaves usually 2* (rarely –5), linear-lanceolate, *spreading* and sometimes sharply toothed, or smaller and bractlike; all glabrous above, often so beneath or sparingly clothed with long, pilose hairs, which fringe the petioles and frequently the leaf-margins. Inflorescence laxly furcate-corymbose, 1–4 (–14)-headed, with straight, slender, erect-spreading branches (sometimes one lower longer), which are sparingly floccose with some fine glandular and spreading pilose hairs. *Heads of medium size, truncate-based*, sometimes stylose-flowered. *Phyllaries* porrect in bud, *dark green*, rather broad, linear-lanceolate, mostly obtuse, sparingly floccose, with rather short, *dark glandular* and few or many longer pilose hairs. Ligules usually glabrous, rarely pilose-tipped. Styles yellow. Margins of receptacle-pits dentate. Achenes nearly black, about 3.5 mm. long.

β . septentrionale Hanb. in Journ. Bot. xxxii. 227 (1894); in Bab. Man. ed. 9, 247 (1904); Williams, l. c. 115 (1902); W. R. Lint. Brit. Hier. 27 (1905); *H. saxifragum* subsp. *argenteum* var. *septentrionale* Zahn, l. c. 252 (1921).

Exsicc.—Hanbury, Bettyhill and Strathy, in Hb. Hanbury; Linton no. 133 (Scullomie); Shoobred, Scullomie, 1900; both in Hb. Mus. Brit.

Leaves large and less glaucous; the radical elliptic-lanceolate, acute, with remote, long, glandular denticulations; the cauline often large, elliptic-lanceolate, finely glandular-serrate to lacinate. Heads larger than in the type; phyllaries densely pilose with few or no glandular hairs.

γ . subglabratum (Hanb.) comb. nov.

H. oreades Hanb. in Journ. Bot. xxvi. 205 (1888), non Fries; *H. oreades* var. *subglabratum* Hanb. in Journ. Bot. xxxii. 227 (1894), in Bab. Man. ed. 9, 247 (1904); W. R. Lint. Brit. Hier. 31 (1905); *H. saxifragum* var. *oreades* Williams, l. c. 112 (1902); *H. saxifragum* subsp. *argenteum* var. *subglabratum* Zahn, l. c. 252 (1921).

Exsicc.—Linton no. 33 (Berriedale); Linton, Berriedale, 1888; Shoobred, Lochmaddy, 1894; all in Hb. Mus. Brit.

Stem 30–50 (–60, cult.) cm. high. Leaves large, the radical lanceolate to elliptic, with \pm long petioles; stem-leaves 2–3, spreading, \pm serrate as in the type. Peduncles with glandular and spreading, dark pilose hairs. *Heads large and handsome*. Phyllaries long, linear-lanceolate, attenuate, acute, sparingly floccose with many long, dark pilose and some fine glandular hairs. Ligules sub-pilose-tipped. Margins of receptacle-pits fimbriate-dentate ap. W. R. Linton.

H. argenteum is widely spread in the mountainous districts of Scotland, Wales and the North of England, as well as in Ireland. It particularly affects rocky river-banks. Its salient features are its narrow, glaucescent, nearly glabrous foliage, with a long, spreading stem-leaf, and its few, long-peduncled, dark and generally sparingly hirsute heads.

The variety *septentrionale*, which is very local, is a coarser plant with greener, more elliptical leaves and larger, more pilose heads. It recalls to some extent *H. Schmidtii* and *H. nitidum*.

The second variety *subglabratum* was at first identified by Hanbury with *H. oreades* Fr. and was subsequently made a variety *subglabratum* of that species. It was transferred as a variety to *H. argenteum* by Zahn. This is a handsome plant

with very large heads, and at first sight looks very different from typical *H. argenteum*, but it possesses the same peculiar, spreading stem-leaves and seems to have been rightly treated by Zahn.

In B.E.C. Report, viii. pt. 1, p. 28 (1927), a plant from Glen Fiagh is referred to *H. stenotum* Dahlst. The specimen (in Herb. Druce) is *H. argenteum*.

H. pseudo-microdon Dahlst. in Johnston's 'Additions to the Flora of Orkney', xiii. pp. 5, 6 (1929), was founded on the exsiccatae Johnston no. 3657, and Sinclair nos. 471 and 604, collected at Berriedale, Hoy, Orkney, in 1927 and 1928. On examining these specimens I am unable to separate them from *H. argenteum* Fr., to which also belong other later gatherings submitted to Dahlstedt (Sinclair nos. 760 and 770, and Johnston no. 4731).

H. argenteum is recorded from the summit of the Glydyrs, near Llanberis, in Ray's Synopsis, p. 45 (1690), under the name of *H. montanum angustifolium nonnihil incanum* C.B.

Distribution.—41. Glamorgan : Treorchy (Riddelsdell). 43. Radnor : Elan (Ley). 47. Montgomery : Craig Breidden (Melvill). 48. Merioneth : Trwystyllon (Ley). Cader Idris (Ridley). 49. Carnarvon : Llanberis ! Aber ! Llanfairfechan ! Nant Francon ! Cwm Idwal ! Foel Fras ! 63. S.W. Yorks : Holmfirth (Woodhead). 68. Cheviotland : Heathpool Linn (Brotherston). 69. Westmorland : Coniston (Mennell). Ullswater ! 70. Cumberland : Keswick ! Watendlath ! Helvellyn ! 72. Dumfries : Moffat (Linton). 80. Roxburgh : Yetholm (Brotherston). 81. Berwick : Kanmore (Brotherston). 86. Stirling : Alva (Drummond). 87. Clackmannan : Glen of Sorrows (Drummond). 88. Mid Perth : Fortingal (Marshall). 89. E. Perth : Glen Shee (Marshall). Blairgowrie ! 90. Forfar : Clova ! 92. S. Aberdeen : Braemar ! 94. Banff : Bridge of Brown (Roffey). 96. E. Inverness : Glen Eunach (Groves). 97. W. Inverness : Moy and Glen Nevis (Marshall). 105. W. Ross : Ben Eay (Salmon). 106. E. Ross : Garve (Marshall). 107. E. Sutherland : Oyckell Bridge (Marshall). 108. W. Sutherland : Inchnadamph and Ullapool (Marshall). 109. Caithness : Ord (Linton). 110. Outer Hebrides : Scarp (Duncan). S. Harris (Shoolbred). 111. Orkney : Hoy (Johnston).

Ireland.—1. S. Kerry : Glencar (Scully). Killarney ! 16. W. Galway : Muchanaght (Hart). 34. E. Donegal : Innishowen and Stranorlar (Hart). 35. W. Donegal : Poisoned Glen (—). 38. Down : Mourne Mts. and Bencrom (Praeger).

var. septentrionale.

108. W. Sutherland : Bettyhill (Hanbury). Scullomie (Marshall). 109. Caithness : Dunbeath (Hanbury). 110. Outer Hebrides : Lewis and N. Harris (Wilmott).

var. subglabratum.

109. Caithness : Berriedale (Linton). 110. Outer Hebrides : Lochmaddy (Shoolbred).

General Distribution.—Scandinavia.

55. *HIERACIUM VAGENSE* Ley in Journ. Bot. xxxviii. 5 (1900) ; Williams, l. c. 117 (1902) ; Hanb. in Bab. Man. ed. 9, 256 (1904) ; W. R. Lint. Brit. Hier. 30 (1905) ; *H. Wiesbaurianum* subsp. *vagense* Zahn, l. c. 267 (1921).

Icon.—Zahn, l. c. fig. 23A.

Exsicc.—Linton no. 63 (Erwood) ; Ley, Llanstephan, 1886, and Erwood, 1887 ; Riddelsdell, Boughrood, 1907 ; Ley, Gloddaeth, 1901 ; all in Hb. Mus. Brit.

Stem 15–40 cm. high, *slender*, striate, becoming floccose above with occasional spreading pilose hairs. *Radical leaves greyish green*, sometimes purpurascant beneath ; the primordial small, oval, obtuse-mucronate, subentire and shortly narrowed below ; the later (often very long in cultivation) *oblong*, obtuse-mucronate,

subentire towards the apex and with sharp, spreading teeth towards the abruptly narrowed base, or lanceolate, acuminate, with deep, sharp, ascending teeth and cuneate base, or sub-pinnatifid in the lower half with long, linear-lanceolate, acuminate teeth which sometimes extend as pinnae nearly to the base of the petioles; stem-leaf 0 or 1, linear-lanceolate or bractlike; all nearly glabrous above and pilose beneath, with pilose margins and long, villous petioles. Inflorescence furcate-corymbose, 2-6-headed, with rather short peduncles, which are floccose with numerous dark glandular hairs. Heads rather large, rounded below. Phyllaries porrect in bud ap. Ley, dark green, linear-lanceolate, acuminate, sparingly floccose, with many long and short glandular and some pilose hairs. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 4 mm. long.

H. vagense is recognizable at a glance by its very narrow, much cut foliage, with teeth often decurrent on the petioles. The foliar hairs are less setiform in this species than in the other members of the Section.

Distribution.—42. Brecon: Erwood and Llangoed (Ley). 43. Radnor: Llanstephan (Ley). Boughrood (Riddelsdell). 49. Carnarvon: Gloddaeth!

Endemic.

56. *HIERACIUM CAMBRICUM* (Baker) F. J. Hanbury in Journ. Bot. xxxii. 229 (1894), in Bab. Man. ed. 9, 256 (1904); W. R. Lint. Brit. Hier. 31 (1905); *H. caesium* var. *cambricum* Baker in Journ. Bot. xvii. 362 (1879); *H. flocculosum* var. *cambricum* Williams, l. c. 119 (1902); *H. Wiesbaurianum* subsp. *cambricum* Zahn, l. c. 267 (1921).

Icones.—Zahn, l. c. fig. 23 B. Pl. 3, fig. b.

Exsicc.—Linton no. 92 (Great Orme) and no. 165 (Cefn Fedw and Great Orme); Marshall no. 3731; Ley, Eglwyseg, 1903; all in Hb. Mus. Brit.

Stem 10-30(-40, cult.) cm. high, slender, glabrous. Radical leaves pale glaucous green, sometimes blotched with deeper green or rarely with a few, pale brown spots; the primordial small, oval, obtuse-mucronate, subentire and abruptly narrowed below; the later lanceolate to linear-lanceolate (rarely elliptic), sharply serrate to deeply and irregularly laciniate towards the base, attenuate below to long, slender petioles; stem-leaf 0 or 1, long-linear or rarely linear-lanceolate with a few sharp teeth; all glabrous on both surfaces, with the margins \pm ciliate with short pilose hairs, which usually sparingly clothe the petioles and sometimes extend along the lower side of the midrib. Inflorescence furcate-corymbose, 4-5(-7)-headed, with slender, straight, erect-spreading branches and peduncles, which are sparingly floccose without glandular or pilose hairs. Heads of medium size, ovoid, subrotund in fruit. Phyllaries subporrect in bud, greyish green, linear-lanceolate, obtuse, floccose (especially on the margins), with fairly numerous dark glandular and few or no pilose hairs. Ligules light yellow, glabrous-tipped. Styles yellow. Margins of receptacle-pits irregularly and sharply dentate. Achenes blackish, 2.5-3 mm. long.

This plant, originally described by Baker as a variety of *H. caesium* Fr., was placed by Hanbury with *H. vagense* as a species of his group *Vulgata Caulescentia*, and by Williams as a variety of *H. flocculosum* Backh. among his *Vulgata Scapigera*. W. R. Linton, in his 'British Hieracia', transferred it to the scapigerous *Oreadea*. In Zahn's Monograph it falls under *H. Wiesbaurianum* Uechtr. as a subspecies along with *H. hypochaeroides* Gibs., *H. cyathis* Ley, *H. britannicum* Hanb., *H. vagense* Ley and others. In Herb. Hanbury there is a specimen brought from Great Orme's Head in 1867 by J. Ward, and labelled 'H.—probably a new species'.

H. cambricum is a very distinct plant not closely allied to any other British species, and one that does not change appreciably under cultivation. Its outstanding feature is its almost absolute glabreity, which is conspicuous from its first growth in

early spring. Its pale green hue, often with dull-green spots on its narrow, much cut foliage, is another noteworthy character, as are also its strongly imbricated, obtuse and relatively hairless phyllaries. The combination of these peculiarities brings the plant towards the Section *Glaucæ*, which is mostly Central European and not represented in Britain, and it is possible that it would be best treated as a member of that group rather than of the *Oreadea*.

Distribution.—41. Glamorgan : Treorchy (Riddlesdell). 49. Carnarvon : Great Orme's Head ! 50. Denbigh : Cefn Fedw (Ley).

Endemic.

Series **Eu-Oreadea** (See page 83.)

57. *HIERACIUM GRIFFITHII* F. J. Hanbury in Bab. Man. ed. 9, 243 (1904). *H. clovense* var. *Griffithii* Hanb. in Journ. Bot. xxxii. 226 (1894); *H. Sommerfeltii* subsp. *Sommerfeltii* var. *Griffithii* Zahn, l. c. 272 (1921).

Exsicc.—Linton no. 127 (Nant Francon); Griffiths, Nant Francon, 1894 and 1897; all in Hb. Mus. Brit.

Stem 20–40 cm. high, rather slender, sparingly floccose throughout, with ± numerous spreading pilose hairs. *Radical leaves* rather small, spreading, pale green usually ± blotched with dark purple; the primordial oblong, obtuse, denticulate, cuneate based; the later *elliptic-lanceolate* to lanceolate, acute, finely or more rarely coarsely serrate or dentate, attenuate below to short, winged, villous petioles; *stem-leaves* 2–4, decreasing upwards, the lowest resembling the innermost basal but sessile, the uppermost linear-lanceolate or linear, ± bractlike; all with ± numerous setose and pilose hairs on both surfaces and the margins, the cauline also floccose beneath. Inflorescence racemose-corymbose, 2–8(–15)-headed, with moderate peduncles, which are sparingly floccose with ± numerous spreading pilose and fine glandular hairs. *Heads of medium size, subtruncate-based*. *Phyllaries* (porrect) in bud, dark green, linear-lanceolate, acute, sparingly floccose with ± numerous dark pilose and fine glandular hairs. Ligules with puberulous tips. Styles yellow. Margins of receptacle-pits incise-dentate. Achenes blackish, nearly 4 mm. long.

This plant, originally collected by J. E. Griffiths and described by Hanbury as a variety of *H. clovense* Lint., was raised to specific rank in 1904 in the ninth edition of Babington's Manual. W. R. Linton, in 'British Hieracia', p. 28, stated that it was indistinguishable from *H. Sommerfeltii* var. *splendens* Hanb., which grows in the same district, but this was evidently not Hanbury's opinion, for he maintained his variety *splendens* separately under *H. Sommerfeltii* in the Manual. Griffiths's original specimens of *H. Griffithii*, now in Herb. Mus. Brit., belong to a distinctly cauligerous plant with rather small, rough, elliptic leaves, entirely different from the narrow-leaved, scapigerous var. *splendens*, which to some extent resembles *H. Sommerfeltii*, with which it was associated by Hanbury. This variety *splendens* has now been raised to specific rank as *H. carneddorum*.

Distribution.—48. Merioneth : Ffestiniog (Ridley). 49. Carnarvon : Nant Francon (Griffiths).

Endemic.

58. *HIERACIUM DEGANWYENSE* Pugsley in Journ. Bot. lxxix. 180 (1941).

Icon.—Pl. 3, fig. c.

Exsicc.—Pugsley no. 548 (Deganwy, 1921) (type), in Hb. Pugsley.

Caulis 10–30(–50, cult.) cm., satis gracilis, praesertim basin versus pilosus, superne \pm floccosus (in cultis tandem e basi multos ramos subpatulos saepe gerens). *Folia radicalia* prasino-viridia, plurima saepe *majuscula*, *ovalia* ad lanceolata, obtuso-mucronata ad acuta, *paucis dentibus remotis patentibus* saepius vix altis praedita, in petiolum alatum breviusculum (in cultis longiorem) attenuata; *caulina* 2–3, infimum petiolatum radicalibus intimis subsimile, superiora lineari-lanceolata dentibus 2–4 acutis notata vel subintegra; omnia *setis rigidis longis* (–5 mm.) *nitidis* superne marginibusque *obsita* (parcius et mollius in paginâ inferiore) petiolis dense villosis, in cultis nonnunquam \pm glabrescentia. Anthela racemoso-corymbosa, 2–8 (–18, cult.)-cephala, pedunculis superioribus longis gracilibus ramulisque longis erecto-patentibus subracemosis (praesertim in cultis) praedita; pedunculi bracteolis 3–4 lineari-subulatis obtecti, flocculosi, glandulis tenuissimis pilisque sparsis vestiti. *Involucra majuscula, lata, basi truncata*. *Squamae* in gemmis porrectae, numerosae, *olivaceae*, lineari-oblongae, obtusae (intimis exceptis), parce flocculosae, pilis \pm brevibus et interdum glandulis paucis tenuibus vestitae. Ligulae apice glabrae. Styli lutei. Alveoli receptaculi margine subulato-dentati, ciliati.

Stem 10–30(–50, cult.) cm. high, rather slender, pilose (especially below) and becoming flocculose above; in cultivation forming \pm spreading tufts. *Radical leaves* dull green; the primordial oval, obtuse-mucronate, subentire, cuneate-based; the later (often *rather large*) oval to lanceolate, obtuse-mucronate to acute, *with a few remote, spreading* and generally rather *shallow teeth*, attenuate below to rather short, winged petioles (longer in cultivation); *stem-leaves* 2–3, the lowest petiolate and resembling the inner basal, the uppermost linear-lanceolate with 2–4 sharp teeth or subentire; all *clothed with long, stiff, shining setose hairs* (–5 mm. long) *on the upper surface and the margins*, more sparingly and softly on the lower surface, and with densely villous petioles; often becoming \pm glabrescent when cultivated. Inflorescence racemose-corymbose, 2–8(–18, cult.)-headed, with long, slender upper peduncles and long, erect-spreading, subracemose branches (especially in cultivation) below; peduncles with 3–4 linear-subulate bracteoles, flocculose, with very fine glandular and some scattered pilose hairs. *Heads rather large, broad, truncate-based*. *Phyllaries* porrect in bud, numerous, *olive-green*, linear-oblong, obtuse (except the innermost), sparingly flocculose, with \pm short pilose and few or no fine glandular hairs. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate-ciliate. Achenes reddish black, 3.5–4 mm. long.

This plant was originally noticed in 1921 on the low cliffs at Deganwy, in Denbighshire, not far from Llandudno, and has been in cultivation since that date in my garden, where it seeds freely. It is best distinguished by its extremely setose leaves, with distant spreading teeth. Under cultivation it develops a low, spreading habit, often with long, irregular branches from the axils of the stem-leaves as well as from the basal rosettes. Among the unmounted and unnamed material in Herb. Hanbury is a set of specimens collected in 1901 at Blackford Hill Quarries, Edinburgh, which seems to belong to this species.

Distribution.—50. Denbigh: Deganwy! 83. Edinburgh: Blackford Hill (—)?

Endemic.

.59. *HIERACIUM BUGLOSSOIDES* Arvet-Touvet, Suppl. Mon. 18 (1876); Hier. Alp. Fr. 72 (1888); W. R. Lint. Brit. Hier. 33 (1905); *H. onosmoides* Hanb. in Journ. Bot. xxx. 131 (1892), ex parte; *H. onosmoides* var. *buglossoides* Hanb. in Bab. Man. ed. 9, 248 (1904); *H. onosmoides* subsp. *subrude* Zahn, l. c. 246 (1921).

Exsicc.—Linton no. 87 (Tain); Marshall no. 2020 (Brora); Marshall, Tain, 1891; all in Hb. Mus. Brit.

Stem 30–60 cm. high, robust, pilose throughout and with scattered, short glandular hairs above. *Radical leaves* yellowish-green, subglaucous; the primordial oblong, rounded-obtuse-mucronulate, subentire, shortly contracted below; the later (usually large) *oblong to long-lanceolate*, attenuate at both ends and often with long petioles, \pm acute, with *distant, sharp, ascending or spreading teeth*; *stem-leaves* 1–5, the lowest petioled and resembling the inner basal, the remainder \pm sessile with fewer and coarser teeth; all *pilose with \pm setiform hairs on both surfaces* (sometimes \pm glabrescent) and on the margins, petioles villous. Inflorescence racemose-corymbose, (1–)5–10(–20)-headed, with long peduncles exceeding the accladium and long, lower subracemose branches; the peduncles floccose with abundant short, dark glandular and a few scattered pilose hairs. *Heads rather large, truncate-based. Phyllaries* (porrect) in bud, numerous, *dark green* with paler margins, linear-lanceolate, \pm acute, slightly floccose, with numerous fine glandular and pilose hairs intermixed. Ligules glabrous-tipped. Styles yellow or faintly livid. Margins of receptacle-pits subulate-dentate, slightly fimbriate. Achenes blackish, about 3.5 mm. long.

H. buglossoides is characterized by an erect, robust habit of growth and long, more or less lanceolate, roughly hairy foliage. Zahn refers our plant to *H. buglossoides* v. *subrude* Arv.-Touv. Hier. Alp. Fr. 72 (*H. onosmoides* subsp. *subrude* Zahn), but it seems to agree with Arvet-Touvet's description of *H. buglossoides a genuinum* rather than with β *subrude*, which has broader, elliptic leaves and less glandular heads and peduncles.

The occurrence of this plant in the north of Scotland seems remarkable in view of its Continental distribution.

Distribution.—106. E. Ross: Tain (Hanbury). Balintore (Marshall). 107. E. Sutherland: Brora (Marshall).

General Distribution (ap. Zahn).—France (Basses-Alpès), Piedmont, Valais, West Germany.

60. *HIERACIUM SCOTICUM* F. J. Hanbury in Journ. Bot. xxvi. 206 (1888); in Bab. Man. ed. 9, 248 (1904); W. R. Lint. Brit. Hier. 34 (1905); Zahn, l. c. 206 (1921); *H. aphyllopodioides* Williams, l. c. 160 (1902)?

Icon.—Zahn, l. c. fig. 19.

Exsicc.—Hanbury, Reay, 1886 and 1887, as *H. norvegicum* f. *latifolia*; Linton no. 14, and Reay, 1888; Marshall, Melvich, 1897; Marshall no. 2001 (Farr); all in Hb. Mus. Brit.

Stem 30–40(–60, cult.)cm. high, normally robust, *setose* with spreading or deflexed hairs *towards the base*, becoming less so and slightly floccose above. *Radical leaves few*, green to glaucous, paler beneath; the primordial oblong-obovate, rounded-obtuse, subentire; the later *broadly elliptic to elliptic-lanceolate* (or rarely lanceolate), subacute to shortly acuminate, *distantly denticulate to sharply dentate* with coarse, divergent teeth, \pm shortly contracted below to short, winged petioles; *stem-leaves* 3–7, the lower shortly petioled, resembling the inner basal but sometimes broader and very coarsely toothed, the upper sessile and decreasing in size; all *hirsute with scattered setae* on both surfaces and *strongly setose on the margins* and petioles. Inflorescence sub-corymbose, 1–8(–12, cult.)-headed, with straight branches exceeding the accladium, the peduncles long, sub-floccose, with scattered, black-based, setose hairs, scarcely glandular. *Heads large, broad, subtruncate below. Phyllaries* incumbent in bud or the outer subporrect, numerous, *dark green with pale margins*, linear-oblong, narrowed above but obtuse, the outer rather lax, \pm floccose, with black-based pilose and a few fine glandular hairs intermixed. Ligules glabrous-tipped. Styles yellow or fuscous. Margins of receptacle-pits subulate- or fimbriate-dentate. Achenes blackish, about 4 mm. long.

β. occidentale Hanb. in Journ. Bot. xxxi. 18 (1893), xxxii. 228 (1894); in Bab. Man. ed. 9, 248 (1904); W. R. Lint. Brit. Hier. 34 (1905); Zahn, l. c. 206 (1921).

Exsicc.—Hanbury, Carrick River, 1891, in Hb. Hanbury.

Whole plant more glabrous than the type. Radical leaves broadly ovate, obscurely sinuate-denticulate, with long petioles but not truncate-based. Stem-leaves 2, similar to the basal, usually both petiolate. Heads 1–3 (–7, cult.), with porrect, lighter coloured phyllaries and yellow styles.

γ. rosulare var. nov.

Exsicc.—W. F. Miller, Sutherland, 1889 (type), in Hb. Mus. Brit.; Pugsley, Melvich, 1927, in Hb. Pugsley.

Folia radicalia quam in typo numerosiora in rosulam plane disposita; caulina plerumque 2 (ad 4, cult.). Involucra quam typi saepe minora. Styli fusci.

Radical leaves more numerous, in a distinct rosette; stem-leaves usually 2 (–4, cult.). Heads often smaller than in the type; styles fuscous.

δ. microphyllum var. nov.

Exsicc.—Barton, Penwyllt, Brecon, 1920 (type); Cryer, Halton, Littondale, 1913; both in Hb. Mus. Brit.

Folia quam typi minora, denticulata ad leviter dentata, minus setosa. Anthela ad 12-cephala. Pedunculi pilis vel glandulis parcissimis immixtis floccosi. Involucra mediocria, squamis obscuris, paulo floccosis, pilosis vel tenuiter glandulosis praedita. Styli lutei.

Leaves smaller than in the type, denticulate to finely dentate, with less setose hair-clothing. Inflorescence—12-headed. Peduncles floccose with very few pilose or glandular hairs. Heads of moderate size, with dark, slightly floccose, pilose or finely glandular phyllaries. Styles yellow.

ε. submaculatum Dahlst. in Johnston, Add. Fl. Orkney, xiii. 5, in Trans. Bot. Soc. Edin. (1929).

Exsicc.—Johnston no. 4241 (Hoy).

Stem slender, purplish; stem-leaves lanceolate, green and purple-spotted, sparingly hirsute. Styles fuscous.

H. scoticum (except the var. *rosulare*) is normally a hypophyllopodous plant, usually distinguishable at once through the abundant, more or less deflexed setae about the base of the stem. It is a handsome plant when well grown.

The plant from Hepste Glen, Brecon, sent out by Linton as *H. scoticum* under no. 166 of his set, was described in 1909 by Ley (Journ. Bot. xlvii. 50) as a variety *simplex* of *H. septentrionale* Arv.-Touv. It was first found by Ley in 1890, and cultivated specimens had been previously distributed as *H. diaphanum* var. *stenolepis*. There is a single wild example in Herb. Hanbury, and judging from this and the cultivated material available, the plant seems to resemble *H. scoticum* but has narrower foliage and smaller heads. It is quite unlike *H. septentrionale* Arv.-Touv. and seems a distinct form worthy of further investigation.

A fragmentary specimen, collected by Druce at Aith Head, Hoy, Orkney, in 1931, was determined by Zahn as '*H. carpathicum* Bess. subsp. *euchrysostylum* Bess. or perhaps a form of *H. dovense* Fr.' (B.E.C. Report, ix. pt. 5, 561 (1932)). The exsiccata is no doubt a weak branch of *H. scoticum*, as suggested by Col. Johnston.

Distribution.—64. M.W. Yorks: Deepdale (Cotton). 88. Mid Perth: Moncrieff Hill (Hanbury). 90. Forfar: Clova (Linton). 108. W. Sutherland: Melvich: Bettyhill (Linton). Farr (Marshall). 109. Caithness: Reay (Hanbury). Thurso (Grant). 110. Outer Hebrides: Barra (Shoolbred). 111. Orkney: Orphir (Syme). Sandwick (Johnston).

Ireland.—34. E. Donegal, Stranorlar (—). 35. W. Donegal: Glenties (Hart).

var. *rosulare*.

108. W. Sutherland : Melvich ! Armadale (Linton). 110. Outer Hebrides : Uig, Lewis (Wilmott).

var. *occidentale*.

Ireland.—35. W. Donegal : Carrick River (Hanbury).

var. *microphyllum*.

42. Brecon : Penwyllt (Barton). 64. M.W. Yorks : Littondale (Cryer).

var. *submaculatum*.

111. Orkney : Hoy (Johnston).

Endemic.

61. *HIERACIUM CHLORANTHUM* Pugsley in Journ. Bot. lxxix. 180 (1941); *H. onosmoides* Hanb. in Journ. Bot. xxx. 131 (1892), ex parte; *H. buglossoides* Lint. in Journ. Bot. xxxi. 148 (1893); *H. saxifragum* var. *pseudonosmoides* Hanb. in Bab. Man. ed. 9, 249 (1904); non Williams, l. c. 112 (1902); *H. pseudonosmoides* W. R. Lint. Brit. Hier. 32 (1905); *H. saxifragum* subsp. *pseudonosmoides* Zahn, l. c. 254 (1921), ex parte; non *H. saxifragum* subsp. *pseudonosmoides* Dahlst. in Act. Hort. Berg. i. 7, 25 (1891); nec *H. onosmoides* Fr. Symb. 102 (1848); nec *H. buglossoides* Arv.-Touv. Suppl. Mon. 18 (1876).

Exsicc.—Linton no. 12 (Uig) (type); Marshall nos. 2161 and 4290; all in Hb. Mus. Brit.

Stem 20–50 cm. high, pilose with long, spreading hairs, especially below, and increasingly floccose upwards. *Radical leaves* few, dull glaucous; the primordial oblong, obtuse-mucronate, subentire; the later *narrowly oblong* to lanceolate, \pm acute, *subentire* or remotely denticulate, or sometimes with distant and shallow, sinuate teeth, attenuate below to relatively short, winged petioles; *stem-leaves* 2–4, decreasing upwards, the lowest resembling the innermost basal, subsessile, the highest small, linear-lanceolate; all clothed with \pm numerous, *setiform hairs on the upper surface* (or occasionally glabrescent), and with long, pilose hairs beneath, on the margins and the petioles; also \pm floccose beneath, chiefly on the cauline leaves. Inflorescence subcorymbose, (1)–3–5(–8)-headed, with long acladium and straight suberect branches, which are densely floccose, and with many spreading pilose but few or no glandular hairs. *Heads of medium size, rounded below. Phyllaries* (porrect) in bud, *dark green with broad paler margins*, lanceolate-subulate, \pm acute, densely floccose with numerous pilose but usually no glandular hairs. *Ligules dull greenish yellow*, glabrous or pilose-tipped, ill developed or \pm tubular. Styles dull yellow (or livid ap. W. R. Linton). Margins of receptacle-pits dentate-fimbriate. Achenes nearly black, 4 mm. long.

This hawkweed, notable for its greenish flowers and occurring as a constant form in numerous Scottish localities, was referred to *H. onosmoides* Fr. and *H. buglossoides* Arv.-Touv. before being identified with Dahlstedt's Norwegian subspecies *pseudonosmoides*. This latter plant is well described by Dahlstedt, and his specimens in Herb. Mus. Brit. (H. Exs. iii. 26 and 27), as well as later Norwegian material there, accord well with his description. His plant, which grows near Oslo, does not possess the peculiar flowers which characterize our Scottish form, and its habit appears to be slenderer and less widely branched, with less hirsute and more toothed foliage. There thus seems no valid ground for referring the Scottish plant to *H. pseudonosmoides* Dahlst., and as it cannot apparently be identified with any other known form, it becomes necessary, in view of its distinct features, to treat it as a new species, and to give it a fresh name to avoid confusion.

Distribution.—88. Mid Perth : Fortingal (Marshall). 89. E. Perth : Glen Shee (Marshall). 92. S. Aberdeen : Braemar ! 94. Banff : Tomintoul (Marshall). 95.

Elgin : Dumphail (Marshall). 96. E. Inverness : Aviemore (Groves). 97. W. Inverness : Loch Laggan (Marshall). Bridge of Roy ! Borodale (Miller). 98. Argyll : Ben Chaisteil (Groves). 99. Dumbarton : Kilpatrick (Watt). 104. N. Ebudes : Uig, Skye (Linton).

Endemic ?

62. *HIERACIUM BEEBYANUM* Pugsley in Journ. Bot. lxxix. 181 (1941).

Exsicc.—Beeby nos. 1048 (Skelberry, Shetland, 1889) (type), 1155 and 1653, all as *H. Schmidtii* var. *crinigerum* ; Shoolbred, Clisham, N. Harris, 1894, as *H. Schmidtii* ; all in Hb. Mus. Brit. ; Brunner, Dargle, 1929, and Powerscourt, 1932 ; in Hb. Pugsley.

Caulis 20–50 cm., *pilis longis patulis* ubique (basin versus dense) *vestitus*. *Folia radicalia pauca*, glaucescentia, plurima *ovali-lanceolata*, obtuso-mucronata, apicem versus remote denticulata, infra medium *dentibus paucis* haud altis (in formâ hibernicâ altioribus) *paululum recurvatis*, inferne breviter cuneata ; *caulina vulgo* 2, inferius prope caulis basin breviter petiolatum radicalibus intimis subsimile vel crassius dentata, superius minus, sessile, lanceolatum, paucis dentibus acutis acuminatum ; omnia utrinque marginibusque *pilis ± setiformibus obsita* vel raro in paginâ superiore glabrescentia, petiolis villosis. Anthela furcato-subracemosa, 2–6-cephala, pedunculis gracilibus 2–4-bracteolatis floccosis, pilis multis pallidis patulis et raro prope involucri paucis glandulis tenuibus obtectis. *Involucri majuscula, basi subtruncata*. *Squamae* in gemmis porrectae, numerosae, *obscurae virides* (intimae pallidiores vel pallide marginatae), lineari-oblongae, obtusae, parce floccosae, senescentes, pilis numerosis basi atris et interdum glandulis paucis tenuibus vestitae. Ligulae apice glabrae vel puberulae. Styli lutei. Alveoli receptaculi margine inciso-dentati.

Stem 20–50 cm. high, clothed throughout (and densely towards the base) with long, spreading pilose hairs. *Radical leaves* few, glaucescent and paler beneath, the primordial small, obovate, very obtuse, subentire and abruptly narrowed below ; the later *oval-lanceolate*, obtuse-mucronate, distantly denticulate towards the apex and with a few distant, shallow (sometimes deeper in the Irish form) and slightly recurved teeth in the lower half, shortly cuneate-based ; *stem-leaves usually* 2, the lower placed low, shortly petioled, and similar to the inner basal (or more coarsely toothed), the upper smaller, lanceolate, acuminate, with a very few sharp teeth, sessile ; all pilose on both surfaces (or the upper occasionally glabrescent), the hairs ± setiform above and on the margins, petioles villous. Inflorescence furcate-subracemose, 2–6-headed, with slender peduncles bearing 2–4 linear-subulate bracteoles and floccose with many pale, spreading pilose hairs, and occasionally a few fine glandular about the base of the heads. *Heads rather large, subtruncate-based*. *Phyllaries* porrect in bud, numerous, dark green (the inner paler or with pale margins), linear-oblong, obtuse, sparingly floccose and senescent, with numerous dark-based pilose and few or no fine glandular hairs. Ligules glabrous- or puberulous-tipped. Styles yellow. Margins of receptacle-pits incise-dentate. Achenes blackish, about 3.5 m. long.

This plant has hitherto been generally regarded as *H. Schmidtii* Tausch (often var. *crinigerum* Fr.), but it differs materially from that species in its markedly pilose stem, its less developed radical rosette and more or less obtuse foliage with distant, recurved teeth, and its truncate-based heads with the numerous obtuse and lightly clad phyllaries that are frequently seen in the species of the series *Eu-Oreadea*. It is therefore treated as a new species and dedicated to W. H. Beeby, who repeatedly collected it during his botanical explorations of the Shetlands.

H. Beebyanum seems to be widely distributed in Shetland, but no specimens have been seen from Orkney. It grows in East Ross and in several stations in the Outer

Hebrides. Then it occurs again in the north and east of Ireland. It seems likely that it has been overlooked in intermediate localities. A specimen in Herb. Backhouse from the Red Screes of Helvellyn, labelled '*H. gothicum*', may possibly belong to it. There is a fine series of specimens from the Bluestack Mountains in Herb. Hanbury.

Distribution.—106. E. Ross : Balintore (Marshall). 110. Outer Hebrides : Clisham, Harris (Shoolbred). Barra (K. B. Blackburn). 112. Shetland : Skelberry, Northmaven, etc. (Beeby).

Ireland.—20. Wicklow : Dargle and Powerscourt (Brunker). 35. W. Donegal : Bluestack Mts. (Hanbury). 38. Down : Bencrom (Praeger).

Endemic.

63. *HIERACIUM ORIMELES* F. J. Hanbury in Journ. Bot. xxxi. 18 (1893) ; W. R. Lint. in Journ. Bot. xxxix. 106 (1901) ; Brit. Hier. 32 (1905) ; Williams, l. c. 113 (1902) ; *H. saxifragum* var. *orimeles* Hanb. in Journ. Bot. xxxii. 228 (1894) ; in Bab. Man. ed. 9, 249 (1904) ; *H. saxifragum* subsp. *orimeles* Zahn, l. c. 254 (1921).

Exsicc.—Linton no. 135 (Nant Francon) ; Ley, Llynfanfechan, 1898, and Carmarthenshire Van, 1899 ; all in Hb. Mus. Brit.

Stem 15–40 cm. high, normally slender, purplish below, with \pm numerous pilose hairs, especially towards the base, becoming also floccose upwards. *Radical leaves* few, pale green ; the primordial oblong, rounded-obtuse-mucronulate, subentire and shortly cuneate below ; the later *oval-lanceolate to lanceolate*, obtuse-mucronate to subacute, remotely *glandular-denticulate* or with a few shallow, denticulate teeth, long-attenuate below to \pm short, winged petioles ; *stem-leaves* 3–5, decreasing upwards, the lowest subsessile, resembling the inner basal but with more distinct teeth, the upper spreading, lanceolate, with a few shallow teeth, sessile, decreasing to linear, entire, bractlike ; all *pubescent* on both surfaces (\pm *setiform* above) and margins, the cauline also \pm floccose beneath, petioles villous. Inflorescence racemose-corymbose, 1–6-headed, with slender peduncles which are floccose with scattered, spreading pilose and a few fine glandular hairs above, lower branches often abortive. *Heads of medium size, subtruncate-based*. *Phyllaries* porrect in bud ap. W. R. Linton, *dark green with paler margins*, lanceolate-subulate, \pm acute, sparingly floccose, with numerous pilose and very few fine glandular hairs. Ligules yellow, glabrous- or pilose-tipped. Styles yellow or slightly livid. Margins of receptacle-pits subulate-dentate ap. W. R. Linton. Achenes blackish, about 3.5 mm. long.

β . argentatum var. nov.

Exsicc.—Pugsley, Killarney, 1934 (type), in Hb. Pugsley ; Marshall no. 2658, in Hb. Mus. Brit.

Caulis glabrescens. *Folia* glauca inferne pallidiora, denticulata, *superne glabra*, in paginâ inferiore parce praesertim in costâ dorsali pilosa, *setis limbata* ; *caulina semi-amplexentia* patentia. Anthela 1–12-cephala, pedunculis flocculosis fere epilosis eglandulosis. Squamae in gemmis incumbentes, quam typi obscuriores latioresque, pilis obscuris satis numerosis glandulisque brevioribus vestitae. Ligulae apice glabrae. Styli lutei. Aliter ut in typo.

Stem glabrescent. *Leaves* glaucous, paler beneath, denticulate, *glabrous above*, sparingly pilose (chiefly on the midrib) beneath, *fringed with setiform hairs* ; the *cauline* (3–4) *semi-amplexicaul* and patent. Inflorescence 1–12-headed, with flocculose peduncles nearly epilose and eglandular. *Phyllaries* incumbent in bud, darker and broader than in the type, with fairly numerous dark pilose and shorter glandular hairs. Ligules glabrous-tipped. Styles yellow. Otherwise like the type.

γ. obscurum var. nov.

Exsicc.—Linton, Grey Mare's Tail, Moffat, 1889 (type), in Hb. Mus. Brit.

Pedunculi floccosi multis pilis obscuris patentibus glandulisque brevioribus obtecti. Squamae quam typi obscuriores magis glandulosae.

Peduncles floccose, with numerous dark, spreading pilose and shorter glandular hairs. Phyllaries darker and more glandular than in the type.

H. orimeles is closely allied to *H. Beebyanum*, but differs in its more entire foliage and greater number of stem-leaves, as well as its rather smaller heads with more acute phyllaries. It is also related to the Scandinavian *H. saxifragum* Fr. and *H. pseudonosmoides* Dahlst. The Carmarthenshire and Moffat examples in herbaria are generally fairly vigorous plants developing several heads, but in North Wales many individual plants produce but one head only, the lateral buds remaining abortive. The Kerry variety *argentatum* is very distinct from the typical species owing to its glaucous, strongly fringed leaves and more ample inflorescence with darker heads. It recalls to some extent the Kerry form of *H. argenteum* Fr.

The earliest notice of *H. orimeles* occurs in Ray's Synopsis, p. 46 (1690), where it appears as *H. fruticosum alpinum latifolium minus uno vel altero flore*, and is stated to grow plentifully on the higher rocks about Llan-Berys.

Distribution.—44. Carmarthen : Llyn-fan-fechan (Ley). 49. Carnarvon : Cwm Idwal ! Nant Francon (Linton). Craig Dulyn (Hanbury). Llanberis !

Ireland.—40. Londonderry : Benevenagh (Lett).

var. *argentatum*.

Ireland.—1. S. Kerry : Killarney ! Glencar (Scully).

var. *obscurum*.

72. Dumfries : Moffat (Marshall).

Endemic.

Sect. VI. SUB-OREADEA sect. nov.

Sect. *Oreadea* W. R. Lint. Brit. Hier. 3 (1905), ex parte ; *H. caledonicum* and *H. Wiesbaurianum* Zahn, l. c. 204 and 254 (1921), pro maj. parte.

Folia radicalia \pm lata, basi rotundata vel truncata, marginum setis minus rigidis quam in Sect. V.

Scapigerous plants of slender or robust habit, with foliage generally \pm glaucous and sometimes purple-spotted. Radical leaves \pm broad, rounded- or truncate-based ; cauline leaves (0-3) narrowed or more rarely rounded below ; leaves with ciliate margins, the hairs normally less long and rigid (setiform) than in the *Oreadea*. Inflorescence \pm furcate-corymbose. Heads of moderate size or rather large, resembling those of the *Oreadea*, with phyllaries usually porrect in bud (except in Series *Caledonica*). Ligules glabrous- or pilose-tipped. Styles \pm yellow, except in *H. fratrum*. Margins of receptacle-pits subulate-dentate, or dentate-fimbriate in *H. Riddelsdellii*.

Flowering May-July, and often later.

The plants placed in this Section resemble the *Oreadea* in the form of the inflorescence and the flower-heads as well as in the tendency to glaucous foliage, but the characteristic Oreadean hair-clothing of the leaves is, on an average, but feebly shown, and all of the species lack the cuneate leaf-base which is generally seen in the radical leaves of the true *Oreadea*. The majority of the *Sub-Oreadea* seem to be

intermediate between the *Oreadea*, series *Pallida*, and the *Vulgata*, subsection *Bifida*; the affinities of *H. caledonicum* and *H. rubicundum* appear doubtful, and they may be related to the *Cerinthoidea*, as was supposed by Zahn.

All the species of the *Sub-Oreadea* are British endemics, with perhaps the exception of *H. Jovimontis*. They inhabit the districts in which the Oreadean species are found and four occur in Ireland, one of which (*H. basalticolum*) is endemic to that country. Some of them are handsome plants and ornamental in the garden. The foliage of *H. hypochaeroides* is particularly beautiful in well-grown specimens, and *H. britanniciforme* is hardly less pleasing.

Series *Caledonica* [Grex *H. caledonicum* Hanb.].

Leaves (including lower cauline) normally \pm rounded below. Phyllaries broad, obtuse, incumbent in bud.

- Plant robust, with \pm elliptic, little toothed leaves. Heads large, \pm broad and truncate-based *H. rubicundum*.
 Plant more slender, with ovate-lanceolate, denticulate leaves. Heads rather large, rounded below *H. caledonicum*.

Series *Hypochaeroidea* [Grex (polymorphus) *H. hypochaeroides* Gibs.].

Radical leaves rounded- or \pm truncate-based. Phyllaries usually narrower, porrect in bud.

* Ligules pilose-tipped.

- Leaves with jaculiform base, slightly toothed; stem-leaf usually 1, large, cordate-based. Heads rather large, with long, acute phyllaries *H. pseudo-repandum*.
 Leaves with subtruncate base, denticulate; stem-leaf 0-1, small. Heads of medium size, with obtuse phyllaries. Margins of receptacle-pits dentate-fimbriate *H. Riddelsdellii*.
 Leaves with truncate base, subentire, floccose beneath; stem-leaf 0-1, small. Heads rather large, with obtuse phyllaries *H. basalticolum*.

** Ligules glabrous-tipped or nearly so.

! Leaves lanceolate to oblong-elliptic, abruptly narrowed below.

- Leaves \pm lanceolate, repand-dentate. Heads rather large, rounded below, with attenuate phyllaries *H. Jovimontis*.
 Leaves \pm oblong-elliptic, denticulate. Heads of medium size, subtruncate-based, with very short accladium and porrect-spreading phyllaries.... *H. cyathis*.

!! Leaves \pm elliptic, normally rounded or subcordate below.

- Leaves spotted, typically subcordate-based. Heads rather large, rounded below, with dark phyllaries *H. hypochaeroides*.
 Leaves unspotted, \pm rounded below. Heads of medium size, ovate-based, with grey-green phyllaries *H. subplanifolium*.

!!! Leaves oval to ovate-lanceolate, \pm truncate-based.

† Leaves unspotted.

- Plant robust, with elliptic-deltoid leaves, sharply toothed (except in vars. *ovale* and *subbritannicum*). Heads rather large, with long, narrow, grey-green phyllaries *H. britannicum*.
 Plant slender, with oval, dentate leaves. Heads rather large, with dark green, obtuse phyllaries *H. dasypodium*.

†† Leaves usually spotted.

- Leaves broadly oval or jaculiform, deeply toothed below, \pm setose. Heads large, subtruncate-based, with acute, grey-green phyllaries *H. britanniciforme*.
 Leaves ovate-elliptic, with sharp, spreading teeth. Heads normally large, rounded below, with obtuse, dark green, very glandular phyllaries.... *H. clovense*.
 Leaves ovate-lanceolate, with shallow teeth. Heads rather large, rounded below, with obtuse, grey-green phyllaries. Styles fuscous *H. fratum*.

Series **Caledonica**. (See page 104.)

64. *HIERACIUM RUBICUNDUM* F. J. Hanbury in Journ. Bot. xxx. 208 (1892); in Bab. Man. ed. 9, 246 (1904); Williams, l. c. 110 (1902); W. R. Lint. Brit. Hier. 25 (1905); *H. caledonicum* subsp. *rubicundiforme* Zahn, l. c. 204 (1921).

Icones.—Zahn, l. c. fig. 18. Pl. 4, fig. a.

Exsicc.—Linton no. 32 (Moffat, cult.); Marshall no. 3728; Ley, Black Mt. Brecon, 1897, and Hatterels, Hereford, 1901; all in Hb. Mus. Brit.

Stem 10–40(–60, cult.) cm. high, normally *robust*, striate, sparingly pilose (chiefly towards the base). *Radical leaves* few, \pm coriaceous, deep bluish green, sometimes clouded with purple; the primordial (withering early) small, subrotund-obovate, obtuse-mucronate, subentire; the later *oval to elliptic*, obtuse-mucronate (or the innermost oblong-lanceolate and more acute), *subentire* or repand-denticulate (rarely repand-dentate) in luxuriant plants, *rounded* or subcuneate below; *stem-leaf* 1 (or a second, often bractlike), *often large*, ovate-lanceolate, acuminate, more coarsely toothed than the radical leaves, contracted to a short, winged petiole; all, with the petioles, \pm pilose, but frequently glabrescent above, marginal hairs often \pm setose. Inflorescence furcate-corymbose, 1–4(–9 or more, cult.)-headed, with straight-based peduncles, which are sparingly floccose with fine glandular and fewer dark pilose hairs. *Heads large*, rather broad, \pm *truncate-based*. *Phyllaries connivent in bud*, *dark green, broad*, linear-oblong, the tips *obtuse* and often reddish, usually sparingly floccose, with many dark-based pilose and a few fine glandular hairs. Ligules glabrous-, or sparingly, or the inner shortly pilose-tipped. Styles yellow to light livid. Margins of receptacle-pits subulate-dentate, \pm fimbriate. Achenes blackish, 4–4.5 mm. long.

β . *Boswellii* Williams, l. c. 110 (1902); Hanb. in Bab. Man. ed. 9, 246 (1904); W. R. Lint. Brit. Hier. 25 (1905); *H. Boswellii* Lint. in Journ. Bot. xxxi. 178 (1893); *H. caledonicum* subsp. *rubicundiforme* var. *Boswellii* Zahn, l. c. 204 (1921).

Exsicc.—Syme, Scapa, Orkney, 1875, in Hb. Hanb.; Linton, Uig and Vaternish, Skye, 1888; Marshall no. 1997 (Tongue); all in Hb. Mus. Brit.

Radical leaves oval to ovate-oblong, denticulate or more often dentate with distant, spreading, shallow teeth, the base abruptly narrowed, sometimes irregularly subtruncate. Stem-leaves 1–3, the lowest often large, ovate, with coarse teeth in the lower half. Phyllaries sometimes more floccose-edged than in the type.

H. rubicundum is readily known by its large, thick, subentire, more or less elliptical foliage, generally with one large stem-leaf, and by its large, broad heads with broad, obtuse phyllaries. The phyllaries are connivent in bud—an anomalous feature for a member of this group. Zahn places this plant, together with *H. caledonicum* Hanb., in a group *Cerinthoidea-Vulgata-Oreadea*, but the *Cerinthoidea* affinity is not obvious.

From the normal Welsh form seedlings have been raised which have grown into luxuriant plants fully 60 cm. high, with large panicles containing over twenty heads of stylose florets. From these a second generation of this stylose-flowered form has been obtained.

The variety *Boswellii* was first described by the brothers Linton as a distinct species, mainly based on Syme's Orkney specimens and their own from Skye. The points of distinction in their account are not very clear, and after Williams (l. c.) had transferred the plant to *H. rubicundum* as a variety, this treatment was adopted both by W. R. Linton and by Hanbury. An examination of the material in Herb. Hanbury and elsewhere indicates that nearly all the specimens from North Scotland that have been referred to *H. rubicundum* are identical with those named *H. Boswellii*, and that the more dentate foliage of the latter is the principal difference. The specimens sent out in the set Linton no. 132 are variable and largely untypical.

An example of normal *H. rubicundum* was collected in the island of Westray, Orkney, by Col. H. H. Johnston in 1937 ; and others in S. Harris, Outer Hebrides, by Mr. W. A. Clark in 1941.

Zahn adopted the name *rubicundiforme* for this plant as a subspecies owing to the existence of an earlier subspecies *rubicundum* (N.P. Hier. Mitteleur. i. 329 (1885)).

Distribution.—36. Hereford : Black Mt. (Ley). 42. Brecon : Beacons (Ley). Taren Llwyd (Riddelsdell). 49. Carnarvon : Snowdon (Linton), Cwm Idwal ! Foel Fras ! 58. Cheshire : Leete (Brown). 65. N.W. Yorks : Deepdale and Barnard Castle (Foggitt). 72. Dumfries : Moffat (Marshall). 110. Outer Hebrides : S. Harris (W. A. Clark). 111. Orkney : Westray (Johnston).

Ireland.—20. Wicklow : Glenmalure, Glen Imaal, etc. (Brunker). 34. E. Donegal : Innishowen (Hart). 35. W. Donegal : Glenties and Kilmacrenan (Hart). 39. Antrim : Sallagh Braes (Stewart). Knock Dhu !

var. *Boswellii*.

97. W. Inverness : Stob Ban, Glen Spean (Marshall). Borrodale (Miller). 104. N. Ebudes : Uig etc., Skye (Linton). 105. W. Ross : Ben Eay (Linton). 108. W. Sutherland : Inchnadamp and Lochinver (Hanbury). Tongue and Ben Loyal (Linton). Bettyhill (Shoolbred). 110. Outer Hebrides : S. Harris (Shoolbred). 111. Orkney : Scapa (Syme).

Ireland.—29. Leitrim : Glenade (Barton).

Endemic.

65. *HIERACIUM CALEDONICUM* F. J. Hanbury in Journ. Bot. xxvii. 75 (1889) ; in Bab. Man. ed. 9, 246 (1904) ; Williams, l. c. 120 (1902) ; W. R. Lint. Brit. Hier. 25 (1905) ; *H. caledonicum* subsp. *caledonicum* Zahn, l. c. 204 (1921).

Exsicc.—Linton nos. 85 (Thurso) and 131 (Scapa) ; Marshall nos. 1976 and 2326 ; all in Hb. Mus. Brit.

Stem 20–35(–50, cult.) cm. high, usually *rather slender*, floccose, slightly pilose especially about the base. *Radical leaves* dull or yellowish green, often purpurascens beneath ; the primordial small, subrotund-obovate, mucronate, subentire ; the later *ovate-lanceolate* to oblong-elliptic, subacute-mucronate or the inner acuminate, remotely *denticulate* with ascending subulate-glandular teeth, \pm *abruptly narrowed below* to moderate petioles ; *stem-leaves normally 2* (rarely 3), the lower often large, subpetiolate, resembling the inner basal (with a few sharp teeth), the upper generally bractlike ; all pilose on both surfaces (or sometimes glabrescent above) and margins, and especially on the petioles, with soft white hairs. Inflorescence subcorymbose, sometimes with a long lower branch, 1–4(–6)-headed, the peduncles slender, straight, suberect, floccose, with a few fine pilose and glandular hairs. *Heads rather large*, ovoid, *rounded below*. *Phyllaries incumbent in bud, dark green with pale margins*, the outer often lax, linear-oblong, *narrowed above and subacute*, floccose (especially on the margins), senescent, with short pilose and fine glandular hairs intermixed. Ligules orange-yellow, glabrous-tipped. Styles brownish-yellow. Margins of receptacle-pits incise-dentate ap. W. R. Linton. Achenes blackish, 3–3.5 mm. long.

β . *pseudo-zetlandicum* (Roffey) comb. nov.

H. pseudo-zetlandicum Roffey in Journ. Bot. lxiii. 316 (1925) ; *H. Shoolbredii* Zahn, l. c. 204 (1921)—nomen ; *H. zetlandicum* E. S. Marshall in Journ. Bot. xxxvi. 172 (1898), non Beeby (1891).

Exsicc.—Linton no. 155 (Bettyhill, 1897) (type), as *H. zetlandicum* Beeby f. or var. ; Marshall no. 2007 (Farr Bay) ; both in Hb. Mus. Brit.

Of more robust habit than the type ; radical leaves more elliptic and more sharply cut, with rather shorter petioles. Heads large ; phyllaries broader, dark green,

scarcely floccose, with few pilose and more numerous glandular hairs. Otherwise like the type.

In habit and foliage this species is somewhat like *H. rubicundum*, but it is less robust and its foliar teeth are finer and normally ascending—not spreading as in the other. Its heads generally show more clearly marked floccose margins to the phyllaries, the outermost of which are crowded and rather lax, and the ligules are of a distinctly orange-yellow colour. It shares with *H. rubicundum* the character of incumbent phyllaries. The hair-clothing of the foliage of *H. caledonicum* is scarcely setiform.

Specimens obtained by Syme in 1870 at Crook of Devon, Kinross, and referred to this species by Elfstrand, appear to belong to a coarse form allied rather to *H. Schmidtii*.

The variety *pseudo-zetlandicum* is regarded by Zahn as intermediate between *H. caledonicum* and *H. scoticum*.

Distribution.—92. S. Aberdeen : Braemar (Hanbury). 104. N. Ebudes : Uig, Skye (Linton). Eigg (K. B. Blackburn). 106. E. Ross : Rockfield (Hanbury). Aultguish (Marshall). 108. W. Sutherland : Melvich ! Ben Loyal and Inchnadamph (Marshall). Bettyhill (Linton). 109. Caithness : Dunbeath (Hanbury). Lybster and Berriedale (Linton). Reay ! Scrabster ! 110. Outer Hebrides : S. Harris (Miss Campbell). 111. Orkney : Scapa (Syme). Orphir (Burdon).

var. *pseudo-zetlandicum*.

108. W. Sutherland : Bettyhill (Marshall).

Endemic.

Series **Hypochaeroidea**. (See page 104.)

66. *HIERACIUM PSEUDO-REPANDUM* Pugsley in Journ. Bot. lxxix. 181 (1941) ; *H. ciliatum* var. *repandum* Ley ex W. R. Lint. Brit. Hier. 45 (1905) ; *H. repandum* Ley in Journ. Bot. xlvii. 13 (1909) ; non Schrank, Denk. Münch. Akad. Phys. Class. 319 (1813), nec Omang (1903).

Exsicc.—Linton no. 172 (Craig Rhiwarth) ; Ley, Craig Rhiwarth, 1904, and Craig Gledsiau, 1905 ; all in Hb. Mus. Brit.

Stem 30–50 cm. high, *slender*, nearly glabrous, sparingly pilose below, becoming floccose with a few scattered, dark-based hairs above. *Radical leaves* deep glaucous green ; the primordial small, subrotund-ovate, obtuse-mucronate, truncate below ; the later *oval*, obtuse-mucronate or the inner cuspidate, remotely *denticulate* or with shallow, sinuate teeth towards the \pm jaculiform base (*rounded* or \pm *truncate* with two spreading, horizontal basal teeth) ; *stem-leaf* usually 1, often large, ovate-lanceolate, acuminate and cordate-based ; all generally glabrescent above (except the primordial), pilose beneath (chiefly on the midrib) and on the margins, with long pilose petioles. Inflorescence furcate-corymbose, 1–3(–5)-headed, with slender, curved branches exceeding the accladium ; peduncles floccose with many fine glandular and some pilose hairs. *Heads* rather large, rounded below. *Phyllaries* porrect in bud, *greyish green* with pale margins, long, linear-lanceolate, *acute* or acuminate, floccose, \pm senescent, with many fine glandular and fewer pilose hairs. *Ligules* long, *strongly pilose-tipped*. Styles yellow. Margins of receptacle-pits unknown. Achenes reddish-black, about 3.5 mm. long.

This plant was first described as a variety of *H. ciliatum* Almq., mainly in all probability on account of its strongly pilose-tipped ligules. When specimens were referred to Dahlstedt in 1907, he dissented from this view, writing, ‘ Not *H. ciliatum*,

too much hair ; too little gland ' ; and the plant was subsequently raised to specific rank by Ley but left among W. R. Linton's *Sub-Vulgata* next to *H. ciliatum*.

H. pseudo-repandum has the glaucescent foliage, furcate inflorescence, rather large heads with porrect phyllaries, and the yellow styles of the *Oreadea*, and cannot be treated as belonging to the Section *Vulgata*. Its affinities appear to lie near *H. subplanifolium* Pugsley and *H. britannicum* Hanb., except for its pilose-tipped ligules, and it seems best placed among the *Sub-Oreadea*.

Distribution.—42. Brecon : Craig Rhiwarth (Ley). Craig Gledsiau (Riddelsdell).
44. Carmarthen : Fanfechan (Riddelsdell).

Endemic.

67. *HIERACIUM RIDDELSDELLII* Pugsley in Journ. Bot. lxxix. 181 (1941); *H. ciliatum* var. *venosum* Ley in Journ. Bot. xlv. 109 (1907); *H. repandum* var. *venosum* Ley, l. c. xlvii. 13 (1909); non *H. venosum* L. Sp. Pl. 800 (1753).

Exsicc.—Ley, Craig-y-Nos, 1904 (type) and 1908; Riddelsdell, Craig-y-Nos, 1904; all in Hb. Mus. Brit.

Stem 10–40 cm. high, rather slender, slightly pilose, especially near the base, and ±floccose above. Radical leaves deep green, rather strongly veined; the primordial oval, rounded-obtuse-mucronate, subentire, abruptly narrowed below; the later oval, ovate or ovate-lanceolate, obtuse-mucronate or the inner acute to acuminate, distantly glandular-denticulate and often with a few small, sharp, spreading teeth at the rounded or subtruncate (occasionally shortly cuneate) base; stem-leaf 0 or 1, linear-lanceolate (rarely ovate, acuminate and subentire); all ±pilose on surfaces and margins with slender, villous petioles. Inflorescence furcate-corymbose, 2–9-headed, compact with short accladium and short, suberect peduncles, which are floccose with many dark glandular or pilose hairs. Heads of medium size, rounded below. Phyllaries (porrect) in bud, dark green, linear-oblong, mostly obtuse, with densely floccose margins, strongly senescent, with many dark glandular or pilose hairs. Ligules strongly pilose-tipped. Styles yellow. Margins of receptacle-pits dentate-fimbriate. Achenes blackish, about 3.5 mm. long.

Like *H. pseudo-repandum* this plant was first described as a variety of *H. ciliatum* Almquist. On the former being raised to specific rank, the variety *venosum* was transferred to it from *H. ciliatum* without change of rank. There is considerable difference, however, between this plant and *H. pseudo-repandum*, although they possess similar strongly pilose-tipped ligules. Its radical leaves lack the jaculiform base often seen in the other, and recall *H. britannicum* Hanb. by their deeply impressed veining. Its inflorescence is more compact than that of *H. pseudo-repandum*, and its heads smaller, with broader and obtuse phyllaries. In these circumstances it is treated as a separate species, and the specific epithet *venosum* being inadmissible as a later homonym, it is named after the late Rev. H. J. Riddelsdell, one of its original collectors. The dentate-fimbriate receptacle-pits are anomalous in this group.

Distribution.—42. Brecon : Craig-y-Nos (Ley and Riddelsdell).

Endemic.

68. *HIERACIUM BASALTICOLUM* Pugsley in Journ. Bot. lxxix. 181 (1941).

Exsicc.—S. A. Stewart, Sallagh Braes (Basaltic Cliffs), Antrim, 1890 (type), and Knochagh, 1890; both in Hb. Mus. Brit. as *H. stenolepis*; Stewart, Cave Hill, Belfast, 1890 and 1893; Barrington, Benevenagh, 1878; both in Hb. Dublin.

Caulis (15–)30–45 mm., *robustus*, glabrescens, basin versus paucis pilis et superne floccis nonnullis pilisque basi obscuris sparsis vestitus. *Folia radicalia* satis crassa, caesia, in paginâ inferiore purpureo-tincta, plurima *ovalia ad ovato-lanceolata*, obtuso-mucronata ad acuta, *subintegra* denticulis tenuibus glanduliferis dentibusque remotis haud altis horizontalibus vel deflexis prope basin \pm *truncatam* plerumque asymmetricam; *caulinum* 0 vel 1, *lineari-lanceolatum* (raro lanceolatum) vel bracteaeforme; *omnia superne subglabra* infra \pm *pilosa floccosa*, marginibus pilis nonnunquam sub-setiformibus ciliatis petiolisque villosis. Anthela furcate-corymbosa, 4–8-cephala, ramis suberectis \pm longis pedunculisque floccosis glandulis multis obscuris pilisque nonnullis obsitis. *Involucra mediocria ad satis magna, basi rotundata*. *Squamae* in gemmis porrectae, *obscure virides*, lineari-lanceolatae, plerumque *obtusae*, praesertim in marginibus floccosae, senescentes, pilis numerosis basi atris glandulisque paucioribus brevibus vestitae. *Ligulae apice pilosae*. Styli lutescentes. Alveoli receptaculi margine subulato-dentati.

Stem (15–)30–45 cm. high, *robust*, glabrescent, with a few pilose hairs below and some floccum and scattered, dark-based pilose hairs above. *Radical leaves* thick, caesious or bluish green, tinged with purple beneath; the primordial small, oval, rounded-obtuse-mucronulate, subentire and truncate-based; the later *oval to ovate-lanceolate*, obtuse-mucronate to acute, *subentire* with fine glandular denticulations and a few shallow, horizontal or deflexed teeth about the (usually asymmetrically) *truncate base*; *stem-leaf* 0 or 1, *linear-lanceolate* (rarely lanceolate) or bractlike; all *subglabrous above* and \pm *pilose and floccose beneath*, with ciliate margins (the hairs sometimes subsetiform) and villous petioles. Inflorescence furcate-corymbose, 4–8-headed, with suberect, \pm long branches, the peduncles floccose with numerous dark glandular and some pilose hairs. *Heads of medium size to rather large, rounded below*. *Phyllaries* porrect in bud, *dark green*, linear-lanceolate, mostly *obtuse*, floccose especially on the margins, senescent, with numerous dark-based pilose and fewer and shorter glandular hairs. *Ligules pilose-tipped*. Styles yellowish. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 4 mm. long.

The plant from Sallagh Braes, originally named *H. stenolepis* Lindbg. by Stewart, was identified by Purchas (Journ. Bot. xxxiii. 115) with his *H. murorum* var. *pachyphyllum*, and was so treated in W. R. Linton's 'British Hieracia'. Original specimens remained under that name in the herbarium of E. F. Linton, now in Herb. Mus. Brit., and the plant is also represented in the herbaria at Dublin and Belfast. It resembles Purchas's plant (*H. pachyphyllum* (Purchas) Williams in its foliage and its inflorescence, but its heads are widely different with narrower and less glandular phyllaries and pilose-tipped ligules. The foliage shows traces of setiform hair-clothing, which suggests a relationship with the *Sub-Oreadea*, and this affinity seems to be confirmed by the structure of the receptacle-pits. The plant is therefore dealt with as a new species, *H. basalticum*, belonging to this group. Specimens collected at Cave Hill, Belfast, in 1890 and 1893, and others from Benevenagh in 1878, appear to be conspecific. I collected the plant at the last-named station in 1937.

In the Section *Sub-Oreadea*, *H. basalticum* falls within the series *Hypochaeroidea* and is closely allied to *H. pseudo-repandum* and *H. Riddelsdelli*, which have similarly pilose-tipped ligules. From the former of these it differs by its thicker, less jaculiform foliage, with small stem-leaf, and by its rather smaller and less glandular heads; from the latter by its more truncate-based leaves and larger heads; it is further separable from both by the floccose undersides of its leaves.

Distribution.—*Ireland*.—39. Antrim: Sallagh Braes and Cave Hill (Stewart). 40. Londonderry: Benevenagh!

Endemic.

69. *HIERACIUM JOVIMONTIS* (Zahn) Roffey in Lond. Cat. ed. 11 (1925); *H. pallidum* subsp. *Jovimontis* Zahn in Koch, Syn. Fl. Germ. ed. 3, iii. 1813 (1901); Pflanzenreich iv. 280, 224 (1921); *H. Schmidtii* et *H. Leyi* auct. angl. ex parte; non *H. Schmidtii* Tausch nec *H. Leyi* Hanb.

Exsicc.—Linton no. 9 (Clova), as *H. Schmidtii*; Linton, Corrie Sharragh and Unich Water, 1889, as *H. Leyi*; Salmon, Slioch, 1896, as *H. Leyi*; Marshall nos. 3056 and 3627, as *H. Leyi*; all in Hb. Mus. Brit.

Stem 15–30(–50) cm. high, rather slender, striate, pilose (chiefly below) to nearly glabrous, ± floccose above. *Radical leaves* spreading, thin, ± glaucous (rarely spotted with purple); the primordial small, oval, apiculate, denticulate; the later oval to lanceolate, apiculate to acute, the outer denticulate to shallowly repand-dentate, the inner dentate with the basal teeth becoming deep and sharp, the lowest horizontal, or some rarely extending down the normally short petiole, the leaf-base abruptly narrowed or subtruncate; stem-leaf 0 or 1, generally small and bractlike but occasionally larger and resembling the inner basal; all nearly glabrous above (except the earliest), pilose beneath, on the margins and especially on the petioles, the pilose hairs less rigid than in *H. Schmidtii* and *H. Leyi*, sometimes also, especially the cauline, ± floccose beneath. Inflorescence furcate-corymbose, 1–6-headed, with branches exceeding the accladium, the peduncles floccose with numerous very fine glandular and few pilose hairs. Heads rather large, rounded below. Phyllaries porrect in bud, greyish green, linear-lanceolate, attenuate and ± acute, outer rather lax, with floccose margins, senescent, and with many black-based pilose hairs, often almost eglandular. Ligules with glabrous or slightly pilose tips. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

H. Jovimontis was introduced into the British list by Zahn, and seems to represent chiefly what was previously regarded as Scottish *H. Leyi*. It shows considerable likeness to the Welsh *H. Leyi*, but differs in its less setose and often more floccose hair-clothing, and its more shortly petioled and more truncate-based radical leaves. Its outer phyllaries also are less conspicuously lax. By these features it is equally distinguishable from *H. Schmidtii*.

In Herb. Linton (now in Herb. Mus. Brit.) there are several specimens from the Clova district that are referred to *H. Schmidtii* var. *superbum* Strömfelt. On one of these (Glen Fiagh, Forfar, 16. vii. 90) is a note, 'Dahlstedt says "is quite identic with *superbum* from Iceland"'. These plants range to 50 cm. in height, with long, lanceolate or oblong leaves, very deeply toothed below, and generally six flower-heads; and they appear to be luxuriant individuals of *H. Jovimontis*.

In view of its continental distribution the occurrence of this plant in Scotland is remarkable, and it may be doubted whether the identification is really correct.

Distribution.—88. Mid Perth: Killin (Hanbury). 90. Forfar: Clova! Canlochen! 92. S. Aberdeen: Braemar (Hanbury). Glen Callater! 96. E. Inverness: Larig Pass (Groves). Dalwhinnie (Marshall). Drumnadrochit (Miss Campbell). 105. W. Ross: Slioch (Salmon). 108. W. Sutherland: Altnaharra (Hanbury). Bettyhill (Foggitt). Heilam Ferry (Marshall). 110. Outer Hebrides: Barra (Somerville).

General Distribution.—Germany. Spain.

70. *HIERACIUM CYATHIS* (Ley) W. R. Linton, Brit. Hier. 30 (1905). *H. hypochaeroides* var. *cyathis* Ley in Journ. Bot. xxxvi. 6 (1898); Williams l. c. 117 (1902); Hanb. in Bab. Man. ed. 9, 250 (1904); *H. Wiesbaurianum* subsp. *cyathis* Zahn l. c. 265 (1921).

Icon.—Zahn, l. c. fig. 23 E 1 & 2.

Exsicc.—Linton no. 109 (Cefn Coed); Riddelsdell, Craig Cille, 1903; Ley, Cheddar, 1902; Marshall no. 3975; all in Hb. Mus. Brit.

Stem 10–30(–40, cult.) cm. high, *rather slender*, \pm pilose with spreading hairs and floccose above. *Radical leaves* thick, *glaucous green*, occasionally slightly spotted with purple; the primordial oval, retuse, subentire and shortly narrowed below; the later *oblong-elliptic* or partially oblong-obovate, obtuse-mucronate or the innermost acute, subentire towards the apex and *denticulate* to sinuate-dentate towards the *abruptly narrowed or rounded base*; *stem-leaf* 0 or 1, narrowly lanceolate and coarsely sinuate-dentate if placed low, or linear and \pm bractlike if high on the stem; all glabrescent above and \pm pilose beneath, with margins fringed with \pm setiform hairs, petioles villous. Inflorescence subcorymbose, 2–5(–10)-headed, with straight, erect-spreading peduncles exceeding the normally *very short acladium*; the peduncles floccose with many fine, dark glandular and \pm numerous pilose hairs. *Heads of medium size or rather large, subtruncate-based. Phyllaries porrect, with spreading tips, in bud*, the outer often rather lax, *dark green*, linear-lanceolate, acute or acuminate, sparingly floccose with \pm numerous black-based pilose and fine glandular hairs intermixed. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish, 3.5–4 mm. long.

H. cyathis is distinguishable by its tendency to develop more or less obovate outer leaves and by its remarkably short acladium with straight, erect-spreading lateral peduncles. In bud, the phyllaries, overlapping the young ligules, are porrect with their tips spreading outwards, suggesting the form of a cup (*cyathos*), from which the specific epithet is taken. The Cheddar plant is normally dwarfer in habit than that found in Breconshire.

Distribution.—6. N. Somerset: Cheddar! 42. Brecon: Craig Cille! Cefn Coed (Ley).

Endemic.

71. *HIERACIUM HYPOCHAEROIDES* Gibson in Phytol. i. 741 (1843) and i. 907; Williams, l.c. 116 (1902); Hanb. in Bab. Man. ed. 9, 250 (1904); W. R. Lint. Brit. Hier. 28 (1905); *H. Gibsonii* Backh. Mon. 47 (1856); Fries, Epier. 96 (1862); *H. Wiesbaurianum* subsp. *hypochaeroides* Zahn, l. c. 264 (1921).

Icones.—Eng. Bot. ed. 3, t. 842 (as *H. Gibsonii*); Zahn, l. c. fig. 23 g.

Exsicc.—R. F. Thompson, Settle, 1888; Linton no. 35 (Tutshill); Ley, Dyffryn Cwannon, 1893; all in Hb. Mus. Brit.

Stem 20–40 cm. high, *erect*, striate, sometimes purple-tinted, glabrescent, with a few pilose hairs below and some scattered pilose and glandular hairs upwards. *Radical leaves* thick, *pale green, beautifully spotted* or marbled with pale and dark purplish brown; the primordial subrotund or broadly oval, rounded-obtuse-mucronate, subentire and subcordate below; the later *broadly oval to elliptic*, or the innermost oval-lanceolate, obtuse-mucronate to acute, obscurely *glandular-denticulate*, more rarely slightly serrate or with a few coarse teeth about the *subcordate* or abruptly contracted *base*; *stem-leaf* 0 or 1, narrow, linear-lanceolate, subpetiolate; all (except the primordial) glabrescent above and sparingly pilose beneath, the margins ciliate with \pm setiform hairs and the slender petioles long-pilose or villous. Inflorescence furcate-corymbose, 2–4(–6)-headed, with suberect, straight and rather long peduncles, which are sparingly floccose with \pm numerous fine, dark glandular and sometimes some pilose hairs. *Heads rather large, rounded below. Phyllaries porrect* in bud, *dark green*, rather broad, linear-lanceolate, obtuse (except the innermost), floccose chiefly on the margins, with \pm numerous short, dark glandular and longer pilose hairs. Ligules glabrous-tipped. Styles yellowish. Margins of receptacle-pits incise-dentate. Achenes dark reddish-brown, 3.5–4 mm. long.

β. lancifolium W. R. Lint. Brit. Hier. 29 (1905); *H. anglicum* var. *η* Hanb. in Bab. Man. ed. 9, 241 (1904) ?

Exsicc.—Ley, Heseldon Glen, 1902, and Arncliffe, 1904; Linton no. 164 (Clapham); all in Hb. Mus. Brit.

Stem more pilose than in the type. Radical leaves less heavily spotted, larger and longer, oval-lanceolate, shortly narrowed and slightly cuneate below; stem-leaves often 2, the lower large, lanceolate or oval-lanceolate, narrowed below but subsessile, sharply toothed in the lower half. Inflorescence—12-headed, sometimes with a long lower branch; peduncles relatively short, more floccose, with numerous pilose hairs. Phyllaries broad. Styles livescent.

γ. saxorum Hanb. in Journ. Bot. xxx. 209 (1892); in Bab. Man. ed. 9, 250 (1904); Williams, l. c. 117 (1902); W. R. Lint. Brit. Hier. 29 (1905); *H. Wiesbaurianum* subsp. *hypochaeroides* var. *saxorum* Zahn, l. c. 264 (1921); *H. olivaceum* subsp. *llynense* Zahn in B.E.C. Report, ix. pt. v. 560 (1932).

Exsicc.—Ley, Cellwen, 1906; Llyn-fan-fawr, Brecon, 1898 and 1906; Riddelsdell, Carmarthenshire Fan, 1902; Marshall no. 3451 (Auchterneed); all in Hb. Mus. Brit.

Stem 20–50 cm. high. Radical leaves oblong-elliptic, sometimes truncate-based, glandular-denticulate with very few sharp basal teeth; stem-leaf sometimes ovate-lanceolate, sharply dentate; the earliest leaves spotted with purple as in the type, the markings becoming obsolete in the later. Inflorescence with slenderer and less straight branches; phyllaries narrower, with the inner acute.

H. hypochaeroides in its typical form is a distinct and handsome plant with beautifully spotted, elliptical leaves, and rather large heads, with dark involucre, borne on long, erect peduncles. The variety *lancifolium* largely resembles the type, but its foliage is narrower, with a much greater development of the stem-leaves. It was considered by Hanbury to be a hybrid *H. anglicum* × *hypochaeroides*, but there seems to be little to support this view. The variety *saxorum*, as originally described by Hanbury (l. c.), is clearly a modification of *H. hypochaeroides*, but many specimens have been assigned this name which have more affinity with *H. Leyi* or *H. britannicum* Hanb. The Auchterneed plant is eminently variable. Some examples (e.g. Marshall no. 3451) seem identical with the typical Welsh *saxorum*; others (Marshall no. 3450) have unspotted leaves with sharper and deeper teeth; others, again, show narrower foliage and peduncles pilose instead of glandular.

H. olivaceum subsp. *llynense* Zahn in B.E.C. Report (l. c.), founded on exsiccata collected by H. Salter in 1922 on the Carmarthenshire Fan, is shown by the type-specimen in Herb. Druce to be *H. hypochaeroides* var. *saxorum*, a well-known plant in this locality.

Distribution.—34. W. Gloucester: Tutshill (Marshall). 42. Brecon: Dyffryn Cawnon (Ley). 50. Denbigh: Cefn Fedw (Ley). Craig Arthur (Wolley-Dod). 64. M.W. Yorks: Settle! Grassington! 65. N.W. Yorks: Penhill, Wensleydale (Percival). 69. Westmorland: Scout's Scar (Linton). Kirkby Stephen (Murray).

Ireland.—39. Antrim: Murlough Bay (Praeger).

var. *lancifolium*.

64. M.W. Yorks: Settle! Heseldon Glen! Ingleborough (Ley). Clapham (Linton).

var. *saxorum*.

42. Brecon: Cellwen, etc. (Ley). 44. Carmarthen: Fanfechan (Ley). 47. Montgomery: Rhaiader Fawr (Ley). Craig Breidden (Foggitt). 94. Banff: Ben Avon (Marshall). 106. E. Ross: Auchterneed (Marshall). 108. W. Sutherland: Tongue (Marshall).

Ireland.—3. W. Cork: Gurtavehy (Phillips).

Endemic.

72. *HIERACIUM SUBPLANIFOLIUM* Pugsley in Journ. Bot. lxxix. 181 (1941); *H. lasiophyllum* var. *planifolium* Hanb. in Journ. Bot. xxx. 207 (1892); in Bab. Man. ed. 9, 245 (1904); W. R. Lint. Brit. Hier. 25 (1905); *H. pallidum* subsp. *lasiophyllum* var. *planifolium* Zahn, l. c. 221 (1921); non *H. planifolium* Brenner in Act. Soc. Fenn. xii. no. 1, 18 (1894).

Exsicc.—Hanbury, Great Doward, 1889 (type), in Hb. Hanbury; Linton no. 107 (Great Doward); Ley, Symond's Yat, 1895, and Craig Cille, 1904; Linton, Ashwood Dale, 1903; all in Hb. Mus. Brit.

Stem 20–40(–60, cult.) cm. high, *rather robust*, striate, slightly pilose about the base, becoming \pm floccose with a few fine glandular hairs above. *Radical leaves* glaucous; the primordial small, broadly oval to obovate, obtuse-mucronate, subentire or glandular-denticulate, with subtruncate base; the later *ovate-lanceolate to elliptic*, subacute, apiculate (the inner narrower and acuminate), subentire, *denticulate* or with a few shallow, spreading teeth towards the *rounded* or *cuneate* base; *stem-leaf* generally 0, occasionally 1, petioled and resembling the inner basal; all nearly glabrous above, \pm pilose beneath, the margins ciliate with rather long subsetiform hairs, the long petioles densely pilose; hairs more rigid in the Derbyshire form, where they occasionally occur also on the upper leaf-surface. Inflorescence furcate-corymbose, 1–6(–10, cult.)-headed, with long, slender, suberect, forked branches, which are floccose with numerous fine glandular hairs. *Heads* of *medium* size or *rather small*, *ovate-based*. *Phyllaries* porrect in bud, *grey-green* with pale or green margins, long, linear-lanceolate, acuminate, \pm floccose and senescent, with many glandular and fewer dark pilose hairs (darker and more glandular in the Derbyshire form). Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits sharply dentate. Achenes blackish, 3–3.25 mm. long.

This plant, hitherto regarded as a variety of *H. lasiophyllum* Koch, seems essentially distinct owing to its more or less elliptic and acute foliage with hair-clothing that is never markedly setiform as in typical *H. lasiophyllum*.

Distribution.—34. W. Gloucester: Symond's Yat (Marshall). Coldwell (Riddelsdell). 36. Hereford: Great Doward (Hanbury and Ley). 57. Derby: Ashwood Dale (Linton).

Endemic.

73. *HIERACIUM BRITANNICUM* F. J. Hanbury in Journ. Bot. xxx. 366 (1892); in Bab. Man. ed. 9, 251 (1904); Williams, l. c. 126 (1902); W. R. Lint. Brit. Hier. 30 (1905), ex parte; *H. Wiesbaurianum* subsp. *britannicum* Zahn, l. c. 266 (1921); *H. furcilliferum* Dahlst. ap. Johnston in B.E.C. Report x. pt. iii. 475 (1934).

Icones.—Zahn, l. c. fig. 23 D; Pl. 4, fig. b.

Exsicc.—Linton no. 36 (Dovedale); Linton, Buxton and Miller's Dale, 1888; Chee Dale, 1898; Cryer, Miller's Dale, 1912; all in Hb. Mus. Brit.

Stem 20–45 cm. high, \pm *robust*, striate, nearly glabrous, very sparingly pilose and floccose, with occasional glandular hairs above. *Radical leaves* scarcely glaucous, rarely spotted with purple; the primordial subrotund-oval, obtuse-mucronate, subentire or dentate below, with subtruncate base; the later *broadly oval* or elliptic-lanceolate to *lanceolate-deltoid* or *-sagittate*, obtuse-mucronate to acute, usually *with sharp teeth* which increase in size and depth towards the base, where they are often very long and horizontal or deflexed (rarely descending down the rather short petioles), the lamina very strongly veined and abruptly narrowed below or *with broad, truncate* base; *stem-leaf* 0 or 1, *small* and bractlike; all \pm glabrous above, pilose beneath and on the margins, the petioles long-pilose or villous. Inflorescence furcate-subcorymbose, 2–6(–12)-headed, with suberect branches exceeding the generally short accladium, peduncles floccose with \pm fine glandular and a few pilose hairs. *Heads*

rather large, subtruncate below with a few bracteoles immediately below the base. Phyllaries porrect in bud, greyish green, rather long and narrow, linear-lanceolate, acute, floccose especially on the margins, with many rather long pilose and few glandular hairs. Ligules glabrous-tipped. Styles yellowish or livescent. Margins of receptacle-pits subulate-dentate. Achenes nearly black, 3-3.5 mm. long.

β. ovale Ley in Journ. Bot. xlv. 109 (1907).

Exsicc.—Riddelsdell, Craig Cille, 1904, in Hb. Mus. Brit.

Radical leaves large, oval from a truncate or shortly cuneate base, ± obtuse, with shallowly repand-dentate margins. Leaf-hairs partly setose ap. Ley.

γ. subbritannicum (Ley) comb. nov.

H. stenolepis var. *subbritannicum* Ley in Journ. Bot. xlvii. 12 (1909).

Exsicc.—Linton no. 136 (Craig Cille) in Hb. Mus. Brit. as *H. stenolepis*.

Radical leaves often large, ± glaucous (at least beneath), oblong, denticulate or shallowly undulate-dentate, with a few coarse teeth about the ± truncate base, the lowest pair often strongly deflexed; petioles rather long; stem-leaf sometimes lanceolate, sharply toothed and petiolate. Peduncles slender. Phyllaries long, generally finely attenuate, floccose with pilose hairs, glandular hairs sometimes numerous, sometimes very few. Otherwise as in the type.

δ. glaucinum var. nov.

Exsicc.—Pugsley, Winch Bridge, Upper Teesdale, 1903 (type), in Hb. Pugsley; Mennell, Upper Teesdale, 1881, in Hb. Mus. Brit.

Folia radicalia alte glauca, elliptica ad ovato-oblonga, basi rotundata vel subtruncata, denticulata vel dentibus tenuibus argutis adscendentibus saepe laminae basi longioribus angustioribus magisque patulis nonnunquam in petiolo descendentes praedita. Pedunculi dense floccosi. Achaenia 4 mm. longa.

Radical leaves deep glaucous green, elliptic to ovate-oblong with rounded or subtruncate base, denticulate or with fine, sharp, ascending teeth, which are often longer, narrower and more spreading about the base and sometimes continued down the petiole. Peduncles densely floccose. Achenes 4 mm. long.

ε. stenolepiforme var. nov.

Exsicc.—Linton, Cheddar, 1890 (type); Roffey, Cheddar, 1921; both, as *H. stenolepis*, in Hb. Mus. Brit.

Caulis pedunculique graciles. Folia radicalia glauca, interdum inferne purpurascens, vulgo supra glabra, satis angusta, oblonga ad lanceolata, ut in typo argute dentata dentibus basin versus magis patulis raro valde deflexis; caulinum nonnunquam lineari-lanceolatum petiolatum inferne argute dentatum. Pedunculi squamaeque glandulis ± numerosis vestiti. Aliter ut in typo.

Stem and peduncles slender. Radical leaves glaucous, sometimes purpurascens beneath, usually glabrous above, rather narrow, oblong to lanceolate, sharply toothed as in the type but with the basal teeth more spreading and rarely strongly deflexed; stem-leaf sometimes linear-lanceolate, petiolate, sharply dentate below. Phyllaries, like the peduncles, with ± numerous glandular hairs. Otherwise like the type.

This species was treated by Hanbury as belonging to the *Vulgata*, but W. R. Linton placed it among the *Oreadea*. The broad-based foliage and the general absence of stiff setae take the plant away from the true *Oreadean* species, but the porrect phyllaries and yellow styles are features of this group, and the plant seems best regarded as a member of the *Sub-Oreadea*.

The plants now described as var. *subbritannicum* and var. *stenolepiforme* have hitherto been associated with *H. stenolepis* Lindbg., which they both, especially the latter, resemble in habit and foliage. But they are of stronger growth than the Scandinavian *H. stenolepis*, and the under surface of their leaves normally lacks its

characteristic stellate hairs, while the leaf-margins are sometimes strongly fringed. Their heads also are larger and darker than those of *H. stenolepis*, with more or less numerous glandular as well as pilose hairs, and these glandular hairs are constantly present in considerable numbers on the peduncles. Owing to these points of difference, the British plants appear to be connected with *H. britannicum* rather than *H. stenolepis*. A form occurs at Cave Hill, Belfast (Praeger, 1886, and Stewart, 1895), intermediate between typical *H. britannicum* and var. *stenolepiforme*. The *H. murorum* of 'English Botany' (no. 2082) is described from a Cheddar specimen that appears to be var. *stenolepiforme*; the plate was utilized by Syme in the third edition of this work to represent *H. caesium* Fr.

The variety *glaucinum*, one of the characteristic hawkweeds of Upper Teesdale, has been frequently collected and variously named. Some of Mennell's specimens were referred by Backhouse to *H. pallidum* and others to *H. caesium*; and *H. Leyi* and *H. cymbifolium* Purchas have been suggested by later botanists as the correct name. The inflorescence and flower-heads of this plant recall those of typical *H. britannicum*, but its leaves lack the broad, truncate base with coarse, deflexed teeth; in this respect they approach Ley's variety *ovale*, but they are smaller, thicker and more glaucous, and their fine, sharp teeth or denticulations are distinctly different from the repand-dentate leaf-margins of var. *ovale*. This Teesdale plant is therefore treated as a new variety *glaucinum*.

H. furcilliferum Dahlst., founded on four specimens collected at Arthur's Seat, Edinburgh, in 1933 (Sinclair no. 858), seems inseparable from *H. britannicum*. Dahlstedt considered that the plant should be placed under *H. bifidum* Kit. (sensu lato) near *H. stenolepis* Lindbg., but further examples obtained in 1934 (Sinclair no. 1084) confirm from the hair-clothing that the plant belongs to the *Sub-Oreadea* and is conspecific with *H. britannicum*. The phyllaries are darker than in the normal plant, but this feature, like the black rootstocks of the specimens, may be attributed to the town smoke of Edinburgh.

Distribution.—34. W. Gloucester: Chepstow! Pen Moel! 39. Stafford: Alstonfield (Purchas). 49. Carnarvon: Great Orme's Head! 57. Derby: Cressbrook Dale! Monsal Dale! Miller's Dale! Chee Dale! 64. M.W. Yorks: Settle (Ley). Ingleborough! Giggleswick (Foggitt). 83. Edinburgh: Arthur's Seat (Sinclair). 85. Fife: Burntisland (Syme). 104. N. Ebudes: Eigg (K. B. Blackburn).

Ireland.—28. Sligo: Glenade and Lough Gill (Vowell). 29. Leitrim: Lough Gill (Lousley). 39. Antrim: Garron Pt. and Cave Hill (Praeger).

var. *ovale*.

42. Brecon: Craig Cille! 64. M.W. Yorks: Clapham, etc. (Ley). 65. N.W. Yorks: Hawes (Ley).

var. *subbritannicum*.

36. Hereford: Great Doward (Ley). 42. Brecon: Craig Cille!

var. *glaucinum*.

65. N.W. Yorks: Winch Bridge (Foggitt). 66. Durham: Upper Teesdale!

var. *stenolepiforme*.

6. N. Somerset: Cheddar! 47. Montgomery: Rhaiader Fawr (Ley).

Endemic.

74. *HIERACIUM DASYPODUM* Dahlstedt in Johnston, Add. Fl. Orkney, xii. 5-6, in Trans. Bot. Soc. Edin. (1929); non Jord. ex Nyman, Consp. iii. 448 (1881)—nomen solum.

Essicc.—Johnston no. 4012 (Hoy); Sinclair nos. 575 and 661; Linton no. 178 (Hoy), as *H. sarcophyllum* var. *expallidiforme*; all in Hb. Mus. Brit.

Stem 20-35 cm. high, slender, nearly glabrous below, becoming floccose with scattered, dark-based pilose hairs above. Radical leaves ± spreading, deep green suffused with purple beneath; the primordial small, obovate, rounded-obtusely mucronate, denticulate and abruptly narrowed below; the later oval,

rounded-obtuse-mucronate, or the inner oval-lanceolate, \pm cuspidate, denticulate towards the apex, becoming *dentate with spreading teeth* towards the *subtruncate base*, the teeth rarely decurrent on the petioles; *stem-leaf* 0 or 1, linear to lanceolate, subentire or toothed; all with scattered pilose hairs on both surfaces, especially on the midrib beneath, and with pilose margins, the petioles conspicuously villous. Inflorescence furcate-corymbose (1-)2-4(-6)-headed, with straight, erect-spreading branches somewhat exceeding the acladium, peduncles floccose with dark-based pilose and numerous fine, dark glandular hairs. *Heads rather large*, rounded below. *Phyllaries* (porrect) in bud, *dark olive-green* with paler margins, linear-lanceolate, *obtus* or the inner subacute, floccose chiefly on the margins, slightly senescent, with rather dense and long, dark-based pilose and fewer fine, short, dark glandular hairs intermixed. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits unknown. Achenes dark reddish-brown, 3.5-4 mm. long.

This species was at first said to be allied to *H. pycnodon* Dahlst., which is related to *H. sagittatum* Lindbg. of the Section *Vulgata*, but in a following paper on the Orkney flora, published the same year, Colonel Johnston states that, according to later information received from Dahlstedt, it belongs to Zahn's capital species *H. pallidum* Biv.-Bernh.

An examination of the type specimens (Johnston no. 4012) shows that while *H. dasypodum* should be placed with the Oreadean species rather than in the *Vulgata*, it does not possess the characters of the former group in any marked degree and is best regarded as a member of the Section *Sub-Oreadea*. Among the species of this group it shows some resemblance to *H. clovense* Lint. in the outline of its leaves.

H. dasypodum is said by Johnston to be common in the island of Hoy.

Distribution.—111. Orkney: Hoy (Johnston).

Endemic.

75. *HIERACIUM BRITANNICIFORME* Pugsley in Journ. Bot. lxxix. 182 (1941).

Exsicc.—Pugsley no. 546 (type) in Hb. Pugsley; Ley, Great Orme, 1901; Marshall no. 3730; both, as *H. britannicum*, in Hb. Mus. Brit; Bickham, Orme's Hd., 1871, as *H. caesium*, in Hb. Syme.

Caulis 15-35(-60, cult.) cm., *satis robustus*, erectus, glabrescens, praesertim basin versus pilis sparsis sursum pilis paucis glandulisque tenuibus floccosus. *Folia radicalia* firma, glauca, saltem primaria *fusco-purpureo-maculata* (saepe immaculata majora in cultis), plurima *late ovalia vel jaculiformia*, obtuso-mucronata *basi sub-truncata* vel interiora acuta inferne breviter contracta, subintegra denticulatave, *basin versus dentibus paucis crassis argutis*, infimis saepe valde deflexis (dentibus in petiolis longiusculis raro descendentibus); *caulinum* 0-1, *lanceolatum*, acuminatum, parce et argute dentatum, subpetiolatum; primaria in paginâ superiore vulgo setosa, reliqua *plerumque supra glabra, nonnunquam \pm setosa*, omnia inferne pilosa, marginibus pilis \pm setosis ciliatis petiolisque longe pilosis. Anthela furcato-corymbosa, 1-7(-15, cult.)-cephala, ramis breviusculis patulis rectis vel arcuatis acladium breve superantibus, pedunculis floccosis glandulis multis tenuibus pilisque paucis obsitis. *Involucra majuscula, basi bracteolis paucis adpressis subtruncata. Squamae* in gemmis porrectae, *griseo-virides*, lineari-lanceolatae, elongatae, *acutae*, praesertim in marginibus floccosae, pilis multis glandulisque brevioribus immixtis. Ligulae apice glabrae. Styli clare lutei. Alveoli receptaculi margine subulato-dentati.

Stem 15-35(-60, cult.) cm. high, *robust*, erect, glabrescent, with scattered pilose hairs chiefly towards the base, becoming floccose with a few pilose and fine glandular hairs above. *Radical leaves* firm, glaucous, *spotted* (at least the primordial) *with purplish brown* or in cultivation often unspotted; the primordial small, subrotund or broadly oval, rounded-obtuse-mucronate, subentire or slightly toothed towards the subtruncate base; the later (\pm large when cultivated) *broadly oval or jaculiform*,

obtuse-mucronate or the inner acute, subentire or denticulate *with a few coarse, sharp teeth towards the base*, the lowest pair often strongly deflexed (detached teeth rarely present on the rather long petioles), *subtruncate-based* or the inner shortly narrowed below; *stem-leaf* 0 or 1, *lanceolate*, acuminate, subpetiolate, with a few sharp teeth; the primordial often setose on the upper surface, the later *generally glabrous above but sometimes ±setose*, all pilose beneath, the margins ciliate with setiform or pilose hairs and the petioles long-pilose or villous. Inflorescence furcate-corymbose, 1-7(-15, cult.)-headed, with rather short, spreading, straight or arcuate branches exceeding the short acladium, peduncles floccose with many fine glandular and a few pilose hairs. *Heads rather large, subtruncate-based*, with a few bracteoles close to the outer phyllaries. *Phyllaries* porrect in bud, *greyish green*, linear-lanceolate, elongate, *acute*, floccose especially on the margins, with many pilose and shorter glandular hairs intermixed. Ligules glabrous-tipped. Styles pure yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish, 3-4 mm. long.

This plant differs from *H. britannicum* chiefly in its foliage. Its leaves are normally spotted with brown, more definitely setose, less freely but perhaps more coarsely toothed, and with a narrower base. Its inflorescence is also distinct, being more compact with relatively short, spreading branches. The flower-heads are usually larger and more glandular than in *H. britannicum*, and the styles pure yellow instead of more or less discoloured. Both species grow on different parts of the Great Orme, *H. britannicum* as a very dwarf form.

In the garden *H. britanniciforme* is one of the most handsome hawkweeds, which does not become unduly luxuriant and polycephalous. In the B.E.C. Report for 1901 it is referred to (under *H. britannicum*) as 'cabbagey *H. caesium*'.

Distribution.—49. Carnarvon: Great Orme's Head! 68. Cheviotland: Spindleston Hills (Richardson).

Endemic.

76. *HIERACIUM CLOVENSE* Linton in Journ. Bot. xxxi. 147 (1893); Williams, l. c. 122 (1902); Hanb. in Bab. Man. ed. 9, 242 (1904); W. R. Lint. Brit. Hier. 36 (1905); *H. praecox* subsp. *clovense* Zahn, l. c. 235 (1921).

Exsicc.—Linton no. 8 (Clova); Linton, Glen Fiagh and Unich Water, 1890, and Cairnwell, 1894; all in Hb. Mus. Brit.

Stem (15-)20-30(-40) cm. high, *±robust*, nearly glabrous, *±floccose* above. *Radical leaves* spreading, green, usually *much spotted* with purplish brown, and sometimes with purplish clouding beneath; the primordial ovate-orbicular, very obtuse, remotely denticulate, broadly truncate-based; the later *ovate-elliptic*, obtuse, apiculate (or the inner ovate-lanceolate, acuminate), denticulate or *with sharp, spreading* or horizontal, apiculate *teeth*, chiefly towards the generally truncate base, the lowest sometimes long and acute; *stem-leaf* 0 or 1, *narrow lanceolate* or bractlike; all glabrate above (or the primordial pilose), and *±pilose* beneath, chiefly along the midrib, and on the margins, with long-pilose or villous petioles. Inflorescence furcate-corymbose, 1-9-headed, with erect-spreading branches exceeding the short acladium; peduncles floccose with *±dense* dark glandular and a few pilose hairs. *Heads large and handsome, rounded below*. *Phyllaries* porrect in bud, *dark green*, rather broad, linear-lanceolate, *obtuse* except the acute innermost, sparingly floccose, *with dense*, long and short, *dark glandular* and a few pilose hairs. Ligules orange-yellow, glabrous-tipped. Styles yellow. Margins of receptacle-pits shortly dentate ap. W. R. Linton. Achenes reddish-black, about 4 mm. long.

β. uistense var. nov.

Exsicc.—Shoolbred, Ben Eaval, N. Uist, 1894 (type), in Hb. Hanbury.

Folia immaculata, quam typi minus dentata. Involucra squamis brevioribus obtusioribus medioeria. Styli leviter lividi.

Leaves unspotted, less deeply cut than in the type. Heads of medium size, with shorter, obtuse phyllaries. Styles slightly livid.

N. clovense is a handsome hawkweed, very distinct in its dwarf habit, its ovate-elliptic, typically spotted leaves with sharp, spreading teeth, and its large, dark heads with obtuse, densely glandular phyllaries and orange-yellow ligules.

It was originally treated as belonging to the *Alpina-Nigrescentia*, and allied to *H. centripetale* and *H. callistophyllum*, but Hanbury (l. c.) placed it among the *Cerinthoidea*, and W. R. Linton later (l. c.) among his *Silvatica*. Zahn makes it a subspecies of *H. praecox* Schultz-Bip. under his group *Oreadea-Vulgata*. Its affinities seem to lie chiefly with the last-named group and with the *Alpina-Nigrescentia*, and as its broad, truncate-based foliage apparently excludes it from the Section *Subalpina*, it is placed here among the *Sub-Oreadea*.

A hawkweed from Clova, said to be allied to *H. leucograptum* Dahlst., is reported in B.E.C. Report, viii, pt. 1, p. 28 (1927). The specimen (in Herb. Druce) is *H. clovense*.

Distribution.—72. Dumfries : Moffat (Marshall). 89. E. Perth : Glen Shee (Linton). Ben Vrackie and Glen Beg (Foggitt). 90. Forfar : Clova ! 92. S. Aberdeen : Glen Callater (Linton).

var. *vistense*.

110. Outer Hebrides : Ben Eaval, N. Uist (Shoolbred).

Endemic.

77. *HIERACIUM FRATRUM* Pugsley in Journ. Bot. lxxix. 182 (1941).

H. sordidum W. R. Linton ap. Linton in Journ. Bot. xlix. 353 (1911); non *H. sordidum* Gillies (1835).

Exsicc.—W. R. Linton, Moffat, 1907, in Hb. Mus. Brit.

Stem 15–30(–35, cult.) cm. high, \pm robust, almost epilose, but clothed with scattered floccose indumentum. *Radical leaves* thick, dull, glaucous green, *occasionally spotted* with purplish brown; the primordial small, ovate, rounded-obtuse-mucronate, subentire, rounded below; the later *oblong to ovate-lanceolate*, obtuse-mucronate to acute, *denticulate* in the upper half and *with broad, shallow teeth towards the rounded or \pm truncate base*, the lowest pair of teeth often spreading or even deflexed; *stem-leaf* 0 or 1, *small* and bractlike; all glabrescent above, \pm floccose and pilose, chiefly on the midrib, beneath, the margins fringed with \pm setiform hairs and the rather short petioles villous. Inflorescence furcate, 2–3-headed, with straight, suberect peduncles, which are floccose with \pm numerous dark glandular and some pilose hairs. *Heads rather large, rounded below*, with a few bracteoles immediately below the outer phyllaries. *Phyllaries* porrect in bud, *greyish green*, rather broad, linear-lanceolate, *obtuse* except the innermost, *densely floccose*, especially on the margins, with many pilose and some glandular hairs. Ligules glabrous-tipped. *Styles fuscous*. Margins of receptacle-pits unknown. Achenes blackish, about 4 mm. long.

This plant, described by E. F. Linton (l. c.) under his brother's MS. name, *H. sordidum*, was thought to be allied to *H. Schmidtii* and *H. lasiophyllum*. The form of the radical leaves, however, with their more or less truncate bases, rather suggests *H. britannicum*, and their hair-clothing is only moderately setiform. The salient features of *H. fratum* seem to be its dwarf, robust habit, oblong, truncate-based leaves, more or less spotted with brown, and rather large, greyish-green flower-heads, with obtuse, floccose phyllaries and fuscous styles.

Distribution.—72. Dumfries : Moffat (W. R. Linton).

Endemic.

Sect. VII. VULGATA.

Fries, *Epicr.* 89 (1862) ; W. R. Lint. *Brit. Hier.* 4 (1905) ; Zahn, l. c. 284 (1921). *Pulmonarioidea* subsect. *Communia* Rouy, *Fl. France*, ix. 316 and 328 (1905).

Plants of robust or slender habit, scapigerous to cauligerous, with green or more rarely \pm glaucous or spotted foliage. Radical leaves with cuneate, rounded, truncate or cordate base ; cauline leaves 0-1(-3) in scapigerous plants, 2-20 in cauligerous forms, narrowed below or more rarely \pm truncate-based ; all normally clothed with \pm soft, simple or denticulate hairs, and without rigid setae on the margins although the hairs of the upper surface may occasionally be \pm short and stiff ; foliar glandular hairs absent but the leaves sometimes floccose, especially on the lower surface. Inflorescence furcate- to paniculate-corymbose, few- to many-headed. Heads large to very small, with phyllaries which are \pm pilose, glandular and floccose, and generally incumbent in bud. Ligules with glabrous or more rarely pilose tips. Styles generally discoloured, rarely pure yellow. Margins of receptacle-pits edentate to \pm subulate-dentate, or rarely dentate-fimbriate.

Flowering May-July, and often later.

The Section *Vulgata* is the most complex in the whole genus *Hieracium* and contains the greatest number of forms. It is allied to the Section *Oreadea*, from which it is best distinguished by the absence of setae developed chiefly about the leaf-margins. The heads in the *Vulgata* are sometimes said to be smaller and more numerous than in the *Oreadea*, with glabrous ligules and discoloured styles, but these points of distinction are subject to many exceptions. Moreover, there exists in Britain a number of species, such as *H. subcyaneum* (W. R. Lint.), which produce flower-heads as large and conspicuous as those of any Oreadean species. These forms seem peculiar to Britain and do not appear to have any analogues in Scandinavia or in Central Europe.

The species of this Section are found not only throughout Europe but also in Northern Asia and North America. They occur in almost every part of the British Isles.

The *Vulgata* are divided by Zahn (l. c.) into :—

A. *Eu-Vulgata*. Inflorescence paniculate. Involucres and pedicels \pm densely glandular, epilose or nearly so, rarely densely pilose.

Principal collective species.

- I. Stem scapiform, 0-1(-3) leaved.
 1. Involucres generally glandular only, or also \pm sparingly pilose *H. murorum*.
 2. Involucres subdensely pilose and glandular. Ligules subciliolate *H. sagittatum*.
- II. Stem few or many-leaved ; leaves narrowed at each end *H. vulgatum*.

Intermediate species.

H. diaphanoides (*murorum* \geq *vulgatum*). *H. laevicaule* (*vulgatum* $>$ *bifidum*).

B. *Caesia*. Inflorescence \pm furcate, few-headed. Involucres and inflorescence not or but slightly glandular, but very often densely or less floccose and \pm densely pilose. Leaves \pm glaucous, nearly always epilose above.

Principal collective species.

- I. Stem scapiform, 0-1(-2)-leaved *H. bifidum*.
- II. Stem few or many-leaved *H. caesium*.

Intermediate species.

H. subramosum (*caesium*-*sagittatum*). *H. angustatum* (*subramosum* $<$ *vulgatum*).

This arrangement is perhaps as much in conformity with the plants' natural affinities as any that could be devised, but it is to some extent theoretical rather

than practical. The difference between a paniculate and a furcate inflorescence in *Hieracium* is a very fleeting one, and can only be judged on very broad lines. The naked, scapiform stem passes imperceptibly into the leafy, caulescent one. And there are endless variations in the proportions of glandular, pilose and floccose hairs on the peduncles and phyllaries.

In treating the British plants the main lines of Zahn's method of classification are here followed but without any species intermediate between the Subsections. Our plants are grouped in six Subsections, thus:—

- | | |
|--|------------------------|
| I. Scapigerous plants with foliage \pm glabrescent above and varying inflorescence; the involucre not densely glandular, \pm pilose and floccose. | <i>Bifida</i> . |
| II. Scapigerous plants with floccose foliage and \pm furcate inflorescence; the involucre densely floccose, \pm pilose and glandular | <i>Stellatifolia</i> . |
| III. Scapigerous plants with \pm pilose foliage and \pm paniculate inflorescence; the involucre densely glandular, sometimes \pm pilose or floccose | <i>Glandulosa</i> . |
| IV. Scapigerous or subscapigerous plants with \pm pilose foliage and \pm paniculate inflorescence; the involucre subdensely pilose, glandular and floccose. | <i>Sagittata</i> . |
| V. Subcauligerous plants with \pm glaucescent foliage (never truncate-based) and \pm furcate or paniculate inflorescence; the involucre \pm densely floccose and pilose, but not densely glandular | <i>Caesia</i> . |
| VI. Cauligerous plants with green, \pm cuneate-based foliage and \pm paniculate inflorescence; the involucre \pm densely glandular, pilose and floccose.. | <i>Eu-Vulgata</i> . |

Subsection BIFIDA subsect. nov.

H. Vulgata subsect. *Silvatica*, W. R. Lint. Brit. Hier. 4. (1905), pro maj. parte; subsect. *Caesia* sp. *H. bifidum* Kit. grex *H. bifidum* (Kit.) Zahn, l. c. 407 (1921), pro min. parte, and grex *H. subcaesium* (Fr.) Zahn, l. c. 420, pro maj. parte.

Plantae scapigeræ foliis glabrescentibus involucriisque floccosis \pm pilosis saepius parce glandulosis praeditae.

Scapigerous plants, usually with the stem and the upper surface of the leaves glabrescent (except in *H. subcyaneum*); stem-leaves 0-1 (-2 in *H. oxyodus*), generally \pm lanceolate. Radical leaves green or \pm glaucous, cordate- to cuneate-based. Inflorescence paniculate- to furcate-corymbose, or rarely subumbellate (aggregate). Heads of medium size to large, rounded- or subtruncate-based, except in *H. oxyodus*. Phyllaries porrect to incumbent in bud, floccose (sometimes densely), with pilose and glandular hairs in varying proportions and quantity. Ligules generally glabrous-tipped. Styles yellow to livid. Margins of receptacle-pits \pm dentate.

The plants placed in this Subsection have a truly scapigerous inflorescence and usually but little hair-clothing on the stem and foliage. The flower-heads are never very small, and in *H. tricolorans* and *H. subcyaneum* are large and handsome, resembling those of the *Sub-Oreadea*. The glandular development on the peduncles and phyllaries is very variable, but even in those species where the glandular hairs are most numerous they are weaker and less in evidence than in the plants included in the Subsection *Glandulosa*.

The species of this group are mostly local endemic plants in Britain, and none are found south of Derbyshire except in Wales. Several occur on the limestone cliffs of Yorkshire and of Mid and South Wales, others on the hills or in the rocky river-valleys of Scotland; one species only is known in Ireland, in county Clare. They are very numerous in Scandinavia, less so in Central Europe.

Series *Sanguinea* [Grex *H. sanguineum* (Ley) W. R. Lint.].

Inflorescence usually \pm furcate-corymbose, with large heads (smaller in *H. pachyphyllum*). Leaves oval, never cuneate-based.

- * Leaves caesious or light green. Phyllaries with numerous glandular hairs, incumbent in bud. Styles yellowish.

Leaves caesious, denticulate, truncate-based. Heads of medium size;

phyllaries greyish green, with numerous pilose hairs *H. pachyphyllum*.

Leaves typically light green, denticulate, subtruncate-based. Heads rather large; phyllaries dark green, with numerous pilose hairs. Ligules pilose-tipped *H. sanguineum*.

** Leaves green. Phyllaries less glandular.

Leaves subdenticulate, \pm hastate-based. Heads rather large; phyllaries greyish green, with soft pilose and fewer glandular hairs, incumbent in bud. Styles yellowish *H. tricolorans*.

Leaves \pm denticulate to shallowly dentate, \pm pilose. Heads large; phyllaries dark greyish green, with numerous pilose hairs, nearly eglandular, porrect in bud. Styles fuscous *H. subcyaneum*.

Series *Eu-Bifida* [Grex *H. bifidum* Kit.].

Inflorescence paniculate-corymbose, with heads of medium size.

* Leaves with sagittate or rounded base.

Leaves large, deep green, oval, subentire, with rounded base. Phyllaries with dark-based pilose and few fine glandular hairs. Styles fuscous .. *H. silvaticoides*.

Leaves spotted, oblong, sinuate-dentate, with \pm sagittate base. Phyllaries with dark-based pilose hairs, nearly eglandular. Styles livid *H. maculosum*.

Leaves glaucous, oblong, denticulate, \pm sagittate-based. Phyllaries porrect in bud, with numerous dark glandular and longer pilose hairs. Styles yellow [*sarcophyllum*, *H. pseudo-*

Leaves green, oval, sharply denticulate, \pm sagittate-based. Acladium very short. Phyllaries dark, conniving to a point in bud, with \pm numerous dark pilose and shorter glandular hairs. Styles fuscous *H. anguinum*.

** Leaves \pm cuneate-based.

Leaves yellowish green, elliptic, serrate below. Phyllaries subporrect in bud, pilose, eglandular. Styles livid *H. neocoracinum*.

Leaves small, dull green, oval, denticulate to sinuate-dentate. Phyllaries porrect in bud, very narrow, with numerous dark glandular and fewer pilose hairs. Styles fuscous *H. prolixum*.

Leaves small, dull green, oblong, subentire, shortly cuneate-based. Phyllaries with many pilose and shorter glandular hairs, connivent in bud. Styles livid or yellow *H. subtenue*.

Series *Aggregata* [Grex *H. aggregatum* Backh.].

Inflorescence \pm subumbellate, with medium-sized heads. Leaves \pm cuneate-based. Phyllaries \pm incumbent in bud.

Leaves deep green, elliptic, denticulate. Phyllaries with scattered, short, dark glandular and solitary pilose hairs. Styles yellow *H. aggregatum*.

Leaves dull green, lanceolate, serrate-dentate; stem-leaves 1-2. Heads narrowed below; phyllaries with numerous pilose hairs, nearly eglandular; ligules pilose-tipped. Styles \pm yellow *H. oxyodus*.

Series *Sanguinea*. (See page 120.)

78. *HIERACIUM PACHYPHYLLUM* (Purchas) Williams, Prod. Fl. Brit. iii. 128 (1902); W. R. Lint. Brit. Hier. 37 (1905); *H. murorum* var. *pachyphyllum*, Purchas in Journ. Bot. xxxiii. 114 (1895); Hanb. in Bab. Man. ed. 9, 253 (1904); *H. murorum* subsp. *pachyphylloides* Zahn, l. c. 330 (1921).

Exsicc.—Linton no. 64 (Symond's Yat); Bickham, Symond's Yat, 1904; Ley, Great Doward, 1896; all in Hb. Mus. Brit.

Stem 30-50 cm. high, *robust*, striate, sparingly pilose below and becoming floccose upwards. *Radical leaves* thick, *caesious* or bluish green, often suffused with purple beneath; the primordial subrotund, subretuse-mucronulate, denticulate, subtruncate-based; the later *oval*, rounded-obtuse-mucronate to subacute, *glandular-denticulate* with a few, generally shallow, denticulate teeth towards the asymmetrically *truncate* or *hastate base*; stem-leaf 0-1, triangular-ovate, acuminate, denticulate and petioled, or linear and bractlike; all \pm glabrous above and softly pilose, especially on the

midrib beneath, with shortly ciliate margins and \pm villous petioles. *Inflorescence furcate-corymbose*, 2–12-headed, with suberect branches exceeding the \pm short accladium, the lower sometimes elongate; peduncles densely floccose with \pm numerous fine, dark glandular hairs. *Heads of medium size*, rounded below. *Phyllaries incumbent in bud*, greyish green with pale margins, rather broad, linear-oblong, \pm obtuse, senescent and densely floccose, especially on the margins, with numerous dark glandular and black-based pilose hairs. Ligules long, glabrous-tipped. *Styles yellowish*. Margins of receptacle-pits dentate ap. W. R. Linton. Achenes reddish black, 3.5 mm. long.

This and the following three species are handsome plants with fine foliage and often large and showy heads. In *H. pachyphyllum* the thick, caesious, little toothed and truncate-based leaves are characteristic, with greyish green phyllaries, clad with much dark glandular and black-based pilose hair, and glabrous-tipped ligules. Zahn substituted the epithet *pachyphyloides*, as a subspecies, owing to the existence of an earlier subspecies *pachyphyllum* Brenner (1894).

Distribution.—34. W. Glo'ster: Symond's Yat (Ley). 36. Hereford: Great Doward (Ley).

Endemic.

79. *HIERACIUM SANGUINEUM* (Ley) W. R. Linton, Brit. Hier. 37 (1905).

H. murorum var. *sanguineum* Ley in Journ. Bot. xxxviii. 4 (1900); Hanb. in Bab. Man. ed. 9, 253 (1904); *H. silvaticum* var. *sanguineum* Williams, l. c. 137 (1902); *H. murorum* subsp. *subsanguineum* Zahn, l. c. 338 (1921).

Exsicc.—Linton no. 140 (Dyffryn Crawnon); Riddelsdell, eodem loco, 1904, and Ley, 1908; all in Hb. Mus. Brit.

Stem 30–40 cm. high, *robust*, striate, almost epilose below, \pm floccose above with scattered fine pilose and short glandular hairs. *Radical leaves light green*, often suffused with red beneath; the primordial small, broadly oval, rounded-obtusely mucronulate, subdenticulate, with rounded base; the later *oval to oblong*, obtusely mucronate or the inner acute or cuspidate, *glandular-denticulate* with a few broad, shallow teeth about the *unequally rounded or subtruncate base* (in luxuriant plants with \pm fine, sharp teeth, occasionally descending the petiole); stem-leaf 0 or 1, small, linear, sessile; all nearly glabrous above, \pm pilose (chiefly on the midrib) beneath, and on the usually short petioles; margins shortly ciliate. *Inflorescence furcate-corymbose*, 2–6-headed, with short accladium and sometimes a long lower branch; the peduncles floccose with dense, short, dark glandular and a few pilose hairs. *Heads rather large*, broad and subtruncate-based. *Phyllaries incurved in bud* ap. Ley, *dark green*, linear-oblong, mostly obtuse, floccose especially on the margins, strongly senescent, with numerous dark glandular and long, grey, black-based pilose hairs. *Ligules shortly pilose-tipped*. *Styles yellowish*. Margins of receptacle-pits shortly dentate. Achenes reddish-black, about 3.5 mm. long.

β . obscurum var. nov.

Exsicc.—Pugsley, Ballyvaughan, 1933 (type), and Lough Bunny, 1933; both in Hb. Pugsley.

Folia radicalia obscure prasino-viridia, subtus purpureo-tincta, quam typi crassiora, nonnunquam alte sinuato-dentata. Squamae atro-virides, marginibus clare albido-floccosis. Styli fusci. Aliter ut in typo.

Radical leaves deep caesious green, suffused with purple beneath, thicker than in the typical species and sometimes deeply sinuate-dentate. Phyllaries blackish green, with well-marked, whitish, floccose margins. Styles fuscous. Otherwise like the type.

H. sanguineum is closely allied to *H. pachyphyllum*, differing in its leaves being sometimes longer and less truncate-based, in its darker, more obtuse phyllaries with whitish, floccose margins, and in its pilose-tipped ligules. It is recorded by Ley for Yorkshire as well as Wales. The variety *obscurum* is characterized by relatively dark green foliage, and darker phyllaries with still whiter margins. It is well represented in Herb. Hanbury. The epithet *subsanguineum*, as a subspecies, was introduced by Zahn on account of the earlier subspecies *sanguineum* NP. (1885).

Distribution.—42. Brecon : Dyffryn Cwannon (Ley).

var. *obscurum*.

Ireland. 9, Clare : Ballyvaughan ! Lough Bunny !

Endemic.

80. *HIERACIUM TRICOLORANS* (Zahn) Pugsley in Journ. Bot. lxxix. 182 (1941).

H. silvaticum var. *tricolor* W. R. Lint. Brit. Hier. 39 (1905) ; *H. bifidum* subsp. *tricolorans* Zahn, l. c. 427 (1921).

Exsicc.—Ley, Thornton Glen, Ingleton, 1903 (type) ; Linton no. 178 (Catterick, as *H. sarcophyllum* var. *expallidiforme*) ; Cryer, Grassington, 1909, and Silverdale, 1917 ; all in Hb. Mus. Brit.

Stem 20–40(–50, cult.) cm. high, *robust*, striate, very slightly pilose about the base, somewhat floccose, increasingly so upwards. *Radical leaves green*, sometimes purpurascens beneath ; the primordial subrotund or broadly oval, subtruncate to subretuse, submucronulate, subentire, unequally cordate-based ; the later (often large) *oval to oblong*, rounded-obtuse-mucronate to shortly cuspidate, *denticulate* (often obscurely) with a few, small, generally very shallow teeth (the lowest pair sometimes deflexed) towards the *hastate or subsagittate base* (the teeth sometimes much larger in cultivation) ; stem-leaf 0–1, normally small, \pm linear and bractlike ; all glabrescent or \pm pilose with short hairs on both surfaces, with shortly ciliate margins and \pm pilose petioles. *Inflorescence paniculate-corymbose*, 3–10(–20, cult.)-headed, with rather short accladium, the peduncles floccose with \pm numerous, fine glandular hairs. *Heads rather large and broad*, rounded below. *Phyllaries incumbent in bud, greyish green*, rather broad, linear-lanceolate, mostly obtuse, \pm densely floccose, especially on the margins, senescent, with \pm numerous soft pilose and some fine glandular hairs intermixed. Ligules glabrous-tipped. *Styles yellowish*. Margins of receptacle-pits incise-dentate. Achenes dark brown, about 3–5 mm. long.

The general aspect of *H. tricolorans* recalls *H. pachyphyllum* or *H. sanguineum*. It differs, however, in its greener foliage, more paniculate inflorescence, and larger, showier heads with fewer and finer glandular hairs on the phyllaries. It has sometimes been confused with *H. subcyaneum* (W. R. Lint.), which grows in the same districts, but it may be distinguished by its broader, more glabrous leaves, its different inflorescence, and its lighter-coloured phyllaries with more numerous though finer glandular hairs.

Distribution.—64. M.W. Yorks : Linton ! Grassington ! Malham (Bradley). Twistleton Scar (Linton). Thornton and Ingleton (Ley). 65. N.W. Yorks : Catterick (Linton). 69. Westmorland : Kendal (Foggitt).

Endemic.

81. *HIERACIUM SUBCYANEUM* (W. R. Linton) Pugsley in Journ. Bot. lxxix. 182 (1941).

H. silvaticum var. *subcyaneum* W. R. Lint. Brit. Hier. 39 (1905) ; *H. bifidum* subsp. *subcyaneum* W. R. Lint. ap. Zahn, l. c. 427 (1921).

Icon.—Pl. 5, fig. a.

Exsicc.—W. R. Linton, Kettlewell, 1904 (type); Linton no. 167 (Ingleton); Ley, Twistleton Scar, 1902, and Upper Wharfedale, 1904; Cryer, Linton, 1921; all in Hb. Mus. Brit.

Stem 20–50 cm. high, nearly glabrous (sometimes slightly pilose below), somewhat flocculose above. *Radical leaves dull green*, sometimes blotched with purple, or purple-tinted beneath; the primordial small, oval, rounded-obtuse-mucronulate, subentire, abruptly contracted below; the later *oval or oblong* to elliptic- or ovate-lanceolate, obtuse-mucronate to acute, subentire or *denticulate to shallowly undulate-dentate*, often with a few large, patent teeth about the *subtruncate or shortly contracted base*, the teeth sometimes continued a little down the petiole; stem-leaf generally wanting, occasionally 1, linear or more rarely ovate-lanceolate, acuminate, petiolate; *all ± pilose* with short, subsetiform hairs above and with longer, softer hairs beneath, with ciliate margins and villous petioles. *Inflorescence furcate-corymbose*, 1–5(–12)-headed, with usually rather long branches and peduncles, which are floccose (sometimes densely) with scattered pilose and rarely some glandular hairs. *Heads normally large and handsome*, broad, rounded-based. *Phyllaries porrect in bud, dark greyish green*, rather broad, linear-lanceolate, acute, very floccose, especially on the margins, *with numerous dark-based pilose hairs*, generally *nearly eglandular*. Ligules glabrous- or ciliate-tipped. *Styles fuscous* (golden ap. W. R. Linton). Margins of receptacle-ports shortly dentate. Achenes blackish, about 4 mm. long.

β. curvidens var. nov.

Exsicc.—Linton, Ashwood Dale, 1903 (type) and Great Rocks Dale, 1903; both in Hb. Mus. Brit.

Folia radicalia longe petiolata, oblonga lanceolatae (quam typi angustiora), in dimidio inferiore dentibus ± incurvatis serrata, omnia basi cuneata. Aliter ut in typo.

Radical leaves long-petioled, oblong or lanceolate (narrower than in the type), serrate in the lower half with ± incurved teeth, all cuneate-based. Otherwise like the type.

H. subcyaneum, as originally described by W. R. Linton (l.c.), and as often found in Yorkshire, is a handsome hawkweed with ± pilose, fairly toothed radical leaves, shortly contracted below, the stem-leaf often absent, and a small corymb of large heads with very pilose but nearly eglandular phyllaries. As already remarked, it is allied to *H. tricolorans*, and it seems to be connected also with *H. Pseudo-Stenstroemii* Pugsl. of the Subsection *Glandulosa*, from which it differs in its shorter, dull green leaves and in its larger and much less glandular heads. It is not known how far these plants are permanently distinct, for there are a number of puzzling forms of this group in Yorkshire, and the specimens in different herbaria have been much confused.

H. silvaticum var. *asymmetricum* Ley ap. W. R. Linton, Brit. Hier. p. 40, seems from some authentic specimens (e.g. Ley, Twistleton Scar, 1903, and Upper Wharfe, 1904) to be identical with *H. subcyaneum*. The exsiccatae Linton no. 168 (Horton), and Ley, Feizor Scar, 1902, are similar except that their peduncles and heads are more glandular and less pilose. Linton no. 168, from Bettyhill, is an entirely different plant, with deeply dentate leaves and very small heads. Of *H. silvaticum* var. *crassum* Ley in Journ. Bot. xlviii. 326 (1910), there are two authentic specimens in Herb. Barton, now in Herb. Mus. Brit., one collected at Pwll Byffre in 1906, the other labelled 'Near Cellwen, 1908'. The two specimens are not identical. The first has large, little toothed, cuneate-based radical leaves, a large, ovate stem-leaf, and a 10-flowered panicle of large, dark heads with densely glandular and pilose phyllaries. The second also has large radical leaves, but these are coarsely dentate towards the cuneate base; the stem-leaf is small and linear; and the panicle has six large, grey, pilose but eglandular heads resembling those of *H. subcyaneum*.

The Derbyshire plant now described as var. *curvidens* seems to be a definite variety distinguishable by its narrower leaves with incurved teeth.

Distribution.—64. M.W. Yorks: Kettlewell (W. R. Linton). Grassington! Linton! Bolton! Settle! Ingleton (Ley). Cray Gill (Cryer).

var. *curvidens*.

57. Derby: Ashwood Dale (Linton).

Endemic.

Series **Eu-Bifida**. (See page 121.)

82. *HIERACIUM SILVATICOIDES* Pugsley in Journ. Bot. lxxix. 182 (1941).

H. silvaticum W. R. Lint. Brit. Hier. 38 (1905) ?

Exsicc.—Pugsley, Heseldon Glen, 1919 (type), and Bolton Woods, 1919; both in Hb. Pugsley.

Caulis 30–40 cm., fere glabratus, sursum ± floccosus. *Folia radicalia* pauca, tenuia, obscure viridia (subtus pallidiora vel purpureo-tincta), plurima petiolis longis gracilibus satis magna, ovalia ad elliptico-ovata, subrotundo-obtuso-submucronulata vel intima breviter acuta, subintegra vel marginibus subundulatis denticulata, vulgo prope basin rotundatam vel subcordatam remote, tenuiter, argute dentata; caulinum 0–1, ovato-acuminatum, dentibus paucis argutis basin rotundatam versus exceptis subintegrum, petiolatum; omnia supra glabrescentia, inferne (praesertim in costâ dorsali) et in petiolis parce pilosa, marginibus breviter ciliatis. *Anthela paniculato-corymbosa*, 5–8-cephala, acladio brevi ramulisque (infimis exceptis) aggregatis vel subumbellatis; pedunculi ± patentes, graciles, plerumque dense floccosi, glandulis sparsis tenuibus pilosi. *Involucra mediocria* ad parvula, basi rotundata. *Squamae* in gemmis (porrectae?), marginibus pallidioribus olivaceae, lanceolato-subulatae, acutae, ± floccosae, senescentes, pilis nonnullis undulatis basi obscuris glandulisque paucis tenuibus vestitae. Ligulae apice glabrae. *Styli fusci*. Alveoli receptaculi margine leviter dentati.

Stem 30–40 cm. high, nearly glabrous below, becoming floccose above. *Radical leaves* few, thin, deep green, paler or suffused with purple beneath; the primordial small, subrotund-ovate, rounded-obtuse, subentire, subtruncate-based; the later large, with long, slender petioles, oval to elliptic-ovate, subrotund-obtuse-submucronulate or the inner shortly acute, subentire or minutely denticulate with ± undulate margins, mostly with a few fine, sharp teeth about the rounded or subcordate base; stem-leaf 0 or 1, ovate-acuminate, subentire except for a few fine, sharp teeth near the rounded base, petioled; all ± glabrous above, sparingly pilose (chiefly along the midrib) beneath and on the petioles, the margins shortly ciliate. *Inflorescence* paniculate-corymbose, 5–8-headed, with the short acladium and the branches above the lowest aggregate or subumbellate, the peduncles slender and ± spreading, usually densely floccose, with a few scattered, fine glandular hairs, pilose. *Heads* of medium size to rather small, rounded below. *Phyllaries* (porrect?) in bud, olive-green with paler margins, lanceolate-subulate, acute, ± floccose, senescent, with some waved, dark-based pilose and a few fine glandular hairs. Ligules glabrous-tipped. *Styles* fuscous. Margins of receptacle-pits obscure, slightly dentate. Achenes blackish, about 3.5 mm. long.

The plant now described as a new species, *H. silvaticoides*, agrees in most respects with the account of *H. silvaticum* Gouan in W. R. Linton's 'British Hieracia' (l. c.). It is not clear, however, whether this name is intended by Linton to represent a definite form, or whether it is used in an aggregate sense to cover the numerous varieties that follow under it. In view of the statement that the plant is generally distributed over Britain and the absence of any precise localities, the latter suggestion is probably the correct one.

H. silvaticoides is related also to *H. cordigerum* Norrl., but it differs (1) in its more robust habit, with much larger leaves, which are broader on an average and subentire instead of distinctly glandular-denticulate; (2) in its inflorescence being apically subumbellate and not irregularly paniculate; and (3) in its broader phyllaries. It is widely spread in Wharfedale and probably extends into Scotland. A specimen obtained at Grange by Charles Bailey and now in Herb. Hanbury was referred to *H. crassiusculum* (Dahlst.). Another specimen in Herb. Mus. Brit. (Hayward, Bowden, Roxburgh, 1913) seems to be this new species but it is too fragmentary for certain determination. The exsiccata Marshall no. 2845 (Tomintoul, Banff), as well as Irish specimens from Benevenagh (Hart, 1882, and Stewart, 1884, in Herb. Dublin), may also be referable here. No British examples have been seen that can be named *H. cordigerum* Norrl. W. R. Linton's record for the Outer Hebrides in 'British Hieracia', p. 39, is probably founded on a specimen collected by Duncan on the island of Scarp. This example is indeterminable in its present condition, but it is not *H. cordigerum*.

H. Scandinavicum Zahn in Schinz and Keller, Fl. Schweiz, ed. 2, ii. 286 (1905) (*H. silvaticum* Almq. Stud, p. xii. 2 (1881)) is probably not British. There are three Scandinavian sheets so named at Kew (Dahlstedt, H. Sc. i. 16 and 17, xvii. 11) which show a plant with rather small, oblong or lanceolate leaves, sharply, irregularly and rather deeply serrate all round, and subtruncate-based. The heads are small, olive-green, with acute, eglandular phyllaries.

Distribution.—64. M.W. Yorks: Bolton Woods! Heseldon Glen! Malham (Bradley). Langeliffe (Ley). Ling Gill (Mrs. Wedgwood). 66. Durham: Upper Teesdale! 69. Westmorland: Grange (Bailey).

Endemic.

83. *HIERACIUM MACULOSUM* Dahlstedt ex Stenström, Värml. Archier, 18 (1889).

H. silvaticum subsp. *maculosum* Dahlst. Bidrag, ii. 65 (1893); *H. silvaticum* var. *maculosum* Williams, l. c. 136 (1902); W. R. Lint. Brit. Hier. 40 (1905); *H. bifidum* subsp. *maculosum* Zahn, l. c. 420 (1921).

Exsicc.—Dahlstedt, H. Exs. i. 47: ii. 24: iv. 55, in Hb. Mus. Brit.; H. Sc. iii. 85 and xi. 8, in Hb. Kew; R. F. Thompson, Airton, in Hb. Hanbury; Pugsley no. 551, in Hb. Pugsley.

Stem 20–50 cm. high, purplish below, sparingly pilose towards the base and slightly flocculose above. *Radical leaves* few, *bright green*, much speckled with purplish brown and ±purpurascens beneath; the primordial small, oval, rounded-obtusely apiculate, denticulate, subtruncate-based; the later ±narrowly oblong to oblong-lanceolate, obtuse-mucronate to acute, *denticulate* towards the apex becoming *sharply sinuate-dentate* with spreading to horizontal teeth at the *abruptly contracted or sagittate base* (teeth occasionally long and decurrent on the petioles); stem-leaf usually 1, linear, entire and sessile to linear-lanceolate and coarsely toothed below; all sparingly pilose on both surfaces, more so on the midrib beneath and on the petioles, margins shortly ciliate. *Inflorescence* *paniculate-corymbose*, or the upper part subumbellate, 3–15-headed, with slender branches exceeding the accladium, the peduncles floccose with scattered pilose and a few very fine glandular hairs. *Heads* of medium size to rather small, rounded below. *Phyllaries* ±*porrect* in bud, *olive-green*, rather narrow, lanceolate-subulate, acute, floccose chiefly on the margins, with numerous dark-based pilose and a few minute glandular hairs. *Ligules* slightly pilose-tipped. *Styles* livid. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3 mm. long.

H. maculosum Dahlst. is well represented by authentic material both in Herb. Mus. Brit. and Herb. Kew. The Scandinavian specimens show long-petioled, oblong leaves, with characteristic fine spots and peculiar basal teeth, and small, olive-green

heads recalling those of *H. praetenerum* Almq. but almost eglandular. The Airton plant referred to *H. maculosum* is represented in Herb. Hanbury by fair specimens which closely resemble the Scandinavian plants and appears to be rightly named. A precisely similar form was found in some plenty in June, 1937, near Ribbleshead (Pugsley no. 551).

The Dublin Canal form identified with this species (coll. Colgan, 1903—now in Herb. Mus. Brit.) has foliage more like that of *H. subulatidens* Dahlst. and densely glandular heads, and cannot be placed in this Subsection.

Distribution.—64. M.W. Yorks : Airton (R. F. Thompson). Ribbleshead!

General Distribution.—Scandinavia. Austria.

84. *HIERACIUM PSEUDO-SARCOPHYLLUM* Pugsley in Journ. Bot. lxxix. 183 (1941).

H. sarcophyllum W. R. Lint. Brit. Hier. 54 (1905) ex parte; non Stenström, Värml. Archier, 15 (1889).

Esicc.—Linton no. 65 (Midlaw Burn) (type); Linton, Black's Hope, 1890; Marshall, Selcoth Burn, 1907; W. R. Linton, Beattock, 1907; all in Hb. Mus. Brit. as *H. sarcophyllum*.

Caulis 25–50 cm., fere glaber. *Folia radicalia glauca*, plurima oblonga, rotundato-obtuso-mucronulata (vel intima lanceolata acuta), *denticulata* vel inferne dentibus paucis parvis patulis praedita, *basi breviter cuneata* vel subtruncata ± sagittata; caulinum 0–1, lanceolatum, acuminatum, argute dentatum, petiolatum; omnia superne glabrescentia, subtus parce pilosa ± floccosa, marginibus ciliatis petiolisque longis ± villosis. *Anthela satis dense paniculato-corymbosa*, 3–8-cephala, acladio brevi et ramulis pedunculisque incurvatis parce flocculosis glandulis obscuris numerosis obsitis. *Involucra mediocria*, basi rotundata. *Squamae* in gemmis porrectae, *atro-virides*, linear-lanceolatae, ± acutae, saepe fere effloccosae, *glandulis multis obscuris pilisque longioribus vestitae*. Ligulae apice glabrae. *Styli lutei*. Alveoli receptaculi margine argute dentati.

Stem 25–50 cm. high, nearly glabrous. *Radical leaves glaucous green*; the primordial small, oval, rounded-obtuse-mucronulate, subentire, shortly contracted to the petiole; the later *oblong*, rounded-obtuse-mucronulate (or the innermost lanceolate, acute), *denticulate* throughout or with a few fine, small, spreading teeth below, the *base shortly cuneate* or subtruncate and ± sagittate; stem-leaf 0–1, lanceolate, acuminate, sharply dentate, petiolate; all glabrescent above, sparingly pilose and ± floccose beneath, with ciliate margins and long, ± villous petioles. *Inflorescence rather closely paniculate-corymbose*, 3–8-headed, with short acladium and incurved branches and peduncles, which are sparingly flocculose but with numerous dark glandular hairs. *Heads of medium size*, rounded-based. *Phyllaries porrect* in bud, *blackish green*, linear-lanceolate, ± acute, often nearly effloccose, *with numerous dark glandular and longer pilose hairs*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits sharply dentate. Achenes reddish black, about 3.25 mm. long.

There are specimens in Herb. Mus. Brit. labelled '*H. sarcophyllum*' from four distinct localities near Moffat, in Dumfries, which are clearly homogeneous and distinct from the other accompanying examples similarly named. This Moffat form was pronounced by Dahlstedt to be a plant unknown in Sweden, allied to *H. sarcophyllum* and its relations. This relationship may be seen by a comparison with authentic material of *H. sarcophyllum* Stenstr. (Dahlst. H. Exs. iii. 36, 37), which differs, however, from the Moffat form by its ampler, more fleshy foliage, and its laxer inflorescence of paler heads with much finer glandular and pilose hair-clothing. This Moffat plant is therefore described as a new species, characterized by its glabrate stem, glaucous, narrow and ± sagittate foliage, and dark, glandular phyllaries. No

other Scottish specimens that have been examined are referable to *H. sarcophyllum* Stenstr.

H. sarcophyllum var. *ampliatum* W. R. Lint. (Brit. Hier. p. 54) is found to be identical with *H. anglicum* var. *calcaratum* Hanb. according to the original specimens, and is dealt with among the *Cerinthoidea*.

H. sarcophyllum var. *expallidiforme* Dahlst., as described by W. R. Linton (l. c.), seems a doubtful plant. No British specimens examined agree with Dahlstedt's account (Bidrag, ii. 169), or with authentic Scandinavian material (Dahlst. H. Exs. ii. 25), which shows large, oval, sinuate-dentate leaves and a paniculate inflorescence with small, rather dark grey heads. Linton's set no. 178 under this name, as represented in Herb. Mus. Brit., is partly *H. tricolorans* (Zahn) (Catterick) and partly *H. dasypodum* Dahlst. (Hoy).

Distribution.—72. Dumfries : Moffat (Marshall).

Endemic.

85. *HIERACTIUM ANGUINUM* (W. R. Linton) Roffey in Lond. Cat. ed. 11 (1925).

H. stenolepis var. *anguinum* W. R. Lint. in Journ. Bot. xxxi. 201 (1893); Hanb. in Bab. Man. ed. 9, 250 (1904); W. R. Lint. Brit. Hier. 38 (1905); *H. bifidum* var. *anguinum* Williams, l. c. 125 (1902); *H. bifidum* subsp. *anguinum* Zahn, l. c. 419 (1921).

Exsicc.—Linton no. 15 (Moffat); Linton, Corrifron, Moffat, 1890; both in Hb. Mus. Brit.

Stem 20–40 cm. high, slender, \pm tinted with red, nearly glabrous throughout. *Radical leaves green*, suberect, somewhat coriaceous; the primordial small, broadly oval, subrotund-obtuse-mucronulate, finely denticulate, subtruncate-sagittate below; the later *oval* to oblong-lanceolate, obtuse-mucronate to acute or cuspidate, *denticulate* with a few *sharp* and mostly *shallow teeth* towards the abruptly contracted and *usually sagittate base*; stem-leaf 0 or more rarely 1, which may be narrow-linear or occasionally resembling the inner basal and petiolate; all glabrous above, sparingly pilose beneath, with shortly ciliate margins and the long, slender petioles glabrescent or slightly pilose. *Inflorescence paniculate-corymbose*, 2–8-headed, with normally a *short acladium*, which sometimes appears *geminat*e through the shortening of the adjacent lateral peduncle, the peduncles \pm flocculose with scattered dark glandular and more rarely a few pilose hairs. *Heads of medium size*, rather narrow, rounded below. *Phyllaries conniving to a point in bud*, blackish green, not numerous, linear-lanceolate, rather broad below becoming attenuate, acute (the inner with a fine setaceous point), sparingly flocculose, with \pm numerous dark pilose and shorter glandular hairs chiefly towards the base. *Ligules glabrous-tipped*. *Styles fuscous*. Margins of receptacle-pits \pm dentate. Achenes reddish black, about 3.5 mm. long.

This elegant hawkweed is notable for its slender habit and glabrescent stem and foliage with the leaf-bases generally more or less sagittate. Its inflorescence is characteristic through the short, sometimes pseudo-geminate acladium, and the dark, attenuate phyllaries are connivent to a point in bud, offering a fanciful resemblance of the head to that of a snake and so suggesting the trivial name 'anguinum'. It differs from *H. pseudo-sarcophyllum* by its green (not glaucous), more toothed foliage, its narrower heads with connivent phyllaries, and its fuscous styles.

In Journ. Bot. xlvii. p. 12, this plant is recorded by Ley for the Welsh counties Brecon and Carmarthen, but the specimens so named in Herb. Mus. Brit. appear to be forms of *H. britannicum* Hanb.

Distribution.—72. Dumfries : Moffat (Linton).

Endemic.

86. *HIERACIUM NEOCORACINUM* Pugsley in Journ. Bot. lxxix. 183 (1941).

H. caesium var. *coracinum* Ley in Journ. Bot. xxxvii. 35 (1899); Hanb. in Bab. Man. ed. 9, 255 (1904); W. R. Lint. Brit. Hier. 59 (1905); non *H. coracinum* Dahlst. in Act. Hort. Berg. II. 4. 64 (1894).

Exsicc.—Ley, Craig Gledsiau, 1895 (type), in Hb. Hanb., and 1896. in Hb. Mus. Brit.

Stem 25–45 cm. high, slender, glabrescent, very sparingly floccose and pilose above. *Radical leaves yellowish green*; the primordial oval, rounded-obtusely-mucronate, subentire, abruptly contracted below; the later *elliptic-lanceolate* to lanceolate, subacute to acuminate, *denticulate or sharply serrate below* the middle with teeth often decurrent on the purple-tinted petioles, \pm *cuneate-based*; stem-leaf 0–1, small, linear to lanceolate, subentire; all glabrescent except on the pilose midrib beneath, with shortly ciliate margins and \pm pilose petioles. *Inflorescence compactly paniculate-corymbose*, with short, ascending branches scarcely exceeding the accladium, 2–6(–8)-headed, the peduncles \pm floccose with a very few, scattered pilose hairs. *Heads of medium size*, rounded below. *Phyllaries subporrect in bud* ap. Ley, *dark olive-green*, linear-lanceolate, acute, floccose chiefly about the base, *with many dark-based pilose hairs, apparently eglandular*. Ligules glabrous-tipped. *Styles livid*. Margins of receptacle-pits incise-dentate ap. W. R. Linton. Achenes blackish, about 3.5 mm. long.

H. neocoracinum, originally described as a variety of *H. caesium* Fr., differs essentially from that species, as understood by Zahn, though it seems to accord in some degree with Fries's own description (Epicrisis, p. 92). Its truly scapigerous habit clearly brings it under *H. bifidum*. Except for the cuneate base and frequently sharp serration of the leaves, and the strongly pilose involucres, it recalls *H. anguinum*, and curiously seems to possess almost similar peculiarly subporrect phyllaries. It is a rare plant, hitherto only known from the old red sandstone rocks of Craig Gledsiau, in the Brecon Beacons.

Distribution.—42. Brecon: Craig Gledsiau (Ley).

Endemic.

87. *HIERACIUM PROLIXUM* Nerrlin, Bidrag, i. 94 (1888); *H. silvaticum* subsp. *prolixum* Dahlst. Bidrag, ii. 41 and 61 (1893); *H. silvaticum* var. *prolixum* Williams, l. c. 136 (1902); W. R. Lint. Brit. Hier. 40 (1905); *H. bifidum* subsp. *prolixum* Zahn, l. c. 425 (1921).

Exsicc.—Dahlst. H. Exs. i. 46; Hanbury, Allt-na-Caillich, Ben Hope, 1888, both in Hb. Hanbury.

Stem 20–30 cm. high, sparingly floccose, with a few scattered pilose hairs below. *Radical leaves small*, thick, *dull green*, paler beneath; the primordial broadly oval, rounded-obtusely-mucronulate, denticulate, abruptly narrowed below; the later *oval*, obovate-lanceolate or the inner lanceolate, obtuse-mucronate to acute or acuminate, *denticulate, becoming sinuate-dentate below*, or the inner with a few sharp, sometimes detached teeth about the \pm *cuneate* (sometimes subsagittate) base; stem-leaf usually 1, lanceolate, acuminate, deeply toothed and petioled; all glabrescent or \pm pilose on both surfaces, with ciliate margins and long-pilose petioles. *Inflorescence paniculate-corymbose*, 5–9-headed, compact with short accladium and branches, the peduncles rather densely flocculose with \pm numerous fine glandular hairs. *Heads of moderate size or rather small*, rounded below. *Phyllaries porrect in bud*, *olive-green*, *very narrow*, almost linear, mostly subacute, \pm floccose, *with numerous dark glandular and fewer, longer pilose hairs*. Ligules glabrous-tipped. *Styles fuscous*. Margins of receptacle-pits subulate-dentate. Achenes reddish black, 3–3.5 mm. long.

The only British specimens examined of this plant were collected in Sutherlandshire. It appears distinct in its relatively dwarf habit and small, little cut foliage, combined with rather small heads and notably narrow phyllaries. It is placed in this group in accordance with the views of Dahlstedt and Zahn, but with some hesitation owing to the glandular development on the peduncles and phyllaries, which may indicate a relationship with *H. killinense* (Zahn) of the Subsection *Glandulosa*.

In Herb. Hanbury there are several specimens referred to this species which were obtained by Rev. H. E. Fox on Helvellyn, Dove Craggs and Dollywaggon Pikes. These exsiccatæ show glabrate foliage and very dark glandular heads, and are not identical with *H. prolixum*. They appear to be a distinct form, possibly connected with *H. angustatum* Lindbg., which deserves further investigation.

Distribution.—108. W. Sutherland : Ben Hope (Hanbury).

General Distribution.—Scandinavia. Galicia, etc.

88. *HIERACIUM SUBTENUË* (W. R. Linton) Roffey in Lond. Cat. ed. 11 (1925).

H. silvaticum var. *subtenuë* W. R. Lint. Brit. Hier. 41 (1905) ; *H. bifidum* subsp. *subtenuë* Zahn, l. c. 428 (1921).

Exsicc.—Linton, Ben Hope, 1886 ; Linton, cult. 1894 (orig. Clova) ; Marshall nos. 3319, 3320 and 3321 ; all in Hb. Mus. Brit.

Stem 25–40 cm. high, normally slender, nearly epilose, becoming floccose upwards with occasional glandular or pilose hairs. *Radical leaves small, dull green* ; the primordial subrotund or subrotund-oval, rounded-obtuse (scarcely mucronulate), entire and rounded below ; the later *oblong*, rounded-obtuse-mucronulate, *subentire* (sometimes with waved margins) or finely denticulate (the innermost lanceolate, acuminate, ±sinuate-dentate, cuneate-based) *shortly narrowed below* to usually rather short, winged petioles ; stem-leaf 0 or 1, linear-lanceolate, ±bractlike ; all glabrescent or ±pilose above, generally pilose beneath, with ciliate margins and the petioles pilose with long, rather stiff hairs. *Inflorescence paniculate-corymbose*, 2–6 (–15, cult.)-headed, with short accladium and sometimes (cult.) long lower branches, the peduncles floccose with ±numerous dark glandular and some pilose hairs. *Heads of moderate size or rather small, rounded below*. *Phyllaries connivent in bud* ap. W. R. Linton, *dark olive-green*, linear-lanceolate, mostly acute, floccose chiefly on the margins, senescent, *with many long, dark-based pilose and shorter glandular hairs*. Ligules glabrate-tipped. *Styles livid or yellow*. Margins of receptacle-pits dentate ap. W. R. Linton. Achenes blackish, about 3.5 mm. long.

β. canispense var. nov.

Exsicc.—C. E. Salmon, Canisp. 1899 (type), in Hb. Mus. Brit.

Caulis gracilis. Folia radicalia quam in typo acutiora, basi magis cuneata, distinctius denticulata ; caulinum plerumque lanceolatum, denticulatum vel tenuiter dentatum, ±petiolatum. Anthela 2–5-cephala. Styli lutei.

Stem slender. Radical leaves more acute and more cuneate-based than in the type, and more distinctly denticulate ; stem-leaf usually lanceolate, denticulate or finely dentate, ±petiolate. Inflorescence 2–5-headed. Styles yellow.

H. subtenuë is allied to *H. prolixum* but is separable by its narrower leaves, and heads with less narrow and less glandular phyllaries.

Distribution.—90. Forfar : Clova (Ley). 96. E. Inverness : Craigellachie (Roffey). 104. N. Ebudes : Sneasdal, Skye (Linton). 106. E. Ross : Oyckell Bridge (Marshall). Strath Garve (Shoobred). 107. E. Sutherland : Glen Einig (Marshall). 108. W. Sutherland : Ben Hope (Marshall). Inchnadamph (Marshall).

var. *canispense*.

108. W. Sutherland : Canisp (Salmon).

Endemic.

Series **Aggregata**. (See page 121.)

89. **HIERACIUM AGGREGATUM** Backhouse, Mon. 52 (1856); Williams, l. c. 147 (1902); Hanb. in Bab. Man. ed. 9, 251 (1904); W. R. Lint. Brit. Hier. 41 (1905); *H. bifidum* subsp. *aggregatum* Zahn, l. c. 421 (1921).

Icon.—Eng. Bot. ed. 3, t. 845.

Exsicc.—Backhouse, Cairntoul, 1855; Linton no. 62 (Glen Derry); Groves, Glen Eunach, 1884; W. R. Linton, Little Craigindal, 1889; Marshall no. 3073; all in Hb. Mus. Brit.

Stem 25–50 cm. high, robust or slender, strict, striate, almost epilose, sparingly floccose from the base upwards. *Radical leaves deep green*, paler beneath, spreading; the primordial small, broadly oval or ovate, rounded-obtuse-mucronulate, finely denticulate, subtruncate-based; the later *elliptic to lanceolate*, obtuse-mucronate to acute, *finely glandular-denticulate* or slightly undulate-dentate, the inner (more rarely all) with some sharp spreading or ascending teeth (which sometimes descend the petiole) about the \pm *cuneate base*; stem-leaf 0 or 1, linear-lanceolate, slightly toothed and sessile, or linear and entire; all \pm pilose on both surfaces (the under surface sometimes also \pm floccose), with ciliate margins and pilose, slightly winged petioles, with \pm setiform hairs. *Inflorescence subumbellate* (aggregate), or corymbose-subumbellate in luxuriant plants, \pm compact but occasionally with a long lower branch, 3–20-headed, with suberect branches and peduncles normally subequalling the rather long acaulium, the peduncles densely floccose, nearly epilose and eglandular. *Heads of medium size*, subtruncate-based. *Phyllaries incumbent in bud, dark green*, rather broad, lanceolate-subulate, mostly obtuse, sparingly floccose (chiefly towards the base), with some *scattered short, dark glandular and a few solitary pilose hairs*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits obscurely dentate. Achenes reddish black, nearly 4 mm. long.

H. aggregatum was discovered by Backhouse and described (l. c.) as long ago as 1856. It is the only British species among the *Phyllopoda* that has a definitely subumbellate inflorescence, by which it may be immediately recognized. It is not clear from its general characters in which group it should be placed, but it seems best treated as belonging to the *Bifida*, largely on account of the sparse clothing of the peduncles and phyllaries.

Distribution.—90. Forfar: Clova (Linton). 92. S. Aberdeen: Cairntoul (Backhouse). Glen Derry! Glen Callater (Marshall). Little Craigindal (Linton). 96. E. Inverness: Glen Eunach (Groves). 97. W. Inverness: Sgoran Dubh (Groves). 108. W. Sutherland: Skerray (Marshall).

Endemic.

90. **HIERACIUM OXYODUS** W. R. Linton, Brit. Hier. 42 (1905), excl. syn., emend.

H. aggregatum var. *prolongatum* Hanb. in Journ. Bot. xxxii. 228 (1894); in Bab. Man. ed. 9, 251 (1904); Williams, l. c. 147 (1902); *H. bifidum* subsp. *oxyodus* Zahn, l. c. 430 (1921).

Exsicc.—Linton no. 110 (Killin); W. R. Linton, Allt Coire Choarach, 1894; Roffey, Allt-Dubh-Galair, 1915; all in Hb. Mus. Brit.

Stem 30–60 cm. high, \pm robust, striate, very sparingly pilose (chiefly below) and slightly floccose. *Radical leaves few*, long-petioled, *dull green*, paler or glaucescent beneath; the primordial lanceolate-obovate, rounded-obtuse-mucronate, sinuate-dentate, attenuate below; the later large, *lanceolate* or long-lanceolate, obtuse-mucronate to acute or acuminate, coarsely and irregularly *serrate-dentate* with \pm ascending and curved teeth which are sometimes continued down the petiole,

shortly or gradually *attenuate below*; *stem-leaves* 1-2(-3, cult.), the lowest linear-lanceolate, acute, deeply serrate or lacinate below, subsessile, the upper smaller, with a few deep, sharp teeth or entire; all with scattered pilose hairs or glabrescent on both surfaces, with ciliate margins and \pm numerous pilose hairs on the petioles. *Inflorescence* *paniculate-subumbellate* or *paniculate-corymbose* with the highest branches subumbellate, sometimes with long lower branches, 2-8(-20)-headed, the peduncles floccose with spreading, pale pilose hairs, eglandular. *Heads* of *medium size* or rather large, *slightly narrowed below*. *Phyllaries connivent in bud* ap. W. R. Linton, \pm *dark olive-green*, linear-oblong, mostly obtuse, \pm *floccose* (chiefly towards the base), senescent, *with numerous long, pale pilose hairs, usually very eglandular, Ligules pilose-tipped*. *Styles light livid or yellow*. Margins of receptacle-pits unknown. Achenes blackish, 3.75 mm. long.

The original description of this species was largely based by W. R. Linton on his exsiccata no. 149 (*H. stenophyes* var. *oxyodus*) from Moffat, and some of its details apply to this plant and not to the Perthshire form that he includes with it. The Moffat plant was subsequently transferred by E. S. Marshall to *H. longilobum* Dahlst., with which some of its specimens closely agree. The present description of *H. oxyodus* is taken from Perthshire specimens; and the exsiccata Linton no. 149, which is not homogeneous, is treated separately under *H. longilobum* and *H. stenophyes*.

H. oxyodus, at present known only from Perthshire, resembles *H. aggregatum* in its inflorescence although this is more decomposed. It differs essentially by its narrower, more toothed radical leaves and the greater development of its stem-leaves, as well as by its more pilose but nearly eglandular phyllaries and pilose-tipped ligules.

Distribution.—88. Mid Perth: Ben Lawers! Killin and Allt Coire Choarach (Linton). Allt-Dubh-Galair (Hanbury).

Endemic.

Subsection STELLATIFOLIA subsect. nov.

Plantae scapigeræ caulibus vix pilosis foliisque obscure viridibus oblongis utrinque (subtus sæpe dense) floccis stellatis vestitæ. Folium caulinum 0-1. Anthela \pm furcato-corymbosa pedunculis dense floccosis. Involucra lata, squamis densissime floccosis \pm pilosis glandulosisque circumdata. Styli lutei. Alveoli receptaculi margine argute dentati.

Scapigerous plants allied to the *Bifida*, with scarcely pilose stems and \pm oblong dull green leaves which are floccose with stellate hairs on both surfaces, often densely so beneath. Stem-leaf 0 or 1. Inflorescence \pm furcate-corymbose, with densely floccose peduncles. Heads broad, with very floccose, \pm pilose and glandular phyllaries. Styles yellow. Margins of receptacle-pits sharply dentate.

The two species placed together to form this Subsection differ from the *Bifida* by the predominantly floccose indumentum of their foliage as well as inflorescence. They are both uncommon plants, one occurring in Wales, the other in the north of England.

Plant dwarf, the leaves with few horizontal teeth about the \pm truncate base.

Phyllaries greyish green, with scattered pilose and short glandular hairs, porrect in bud

H. cillense.

Plant taller, the leaves shortly sinuate-dentate about the cordate or subtruncate base. Phyllaries dark green, with numerous dark glandular and longer pilose hairs, incumbent in bud

H. cymbifolium.

91. *HIERACIUM CILLENSE* Pugsley in Journ. Bot. lxxix. 183 (1941).

H. griseum Ley MS. (nomen), non Forman (1896) ; *H. hypochaeroides* var. *griseum* Ley ex. W. R. Lint. Brit. Hier. 29 (1905) ; *H. Wiesbaurianum* subsp. *hypochaeroides* var. *griseum* Zahn, l. c. 264 (1921).

Exsicc.—Ley, Craig Cille, 1904 (type), as *H. griseum*, in Hb. Mus. Brit.

Caulis 20–35 cm., striatus, glabratus, superne \pm floccosus. *Folia radicalia* patentia, parvula, crassa, obscure viridia, *leviter purpureo-maculata*, subtus nonnquam purpurascens, plurima *oblonga*, obtuso-mucronata ad subacuta, *subintegra* vel basin versus 2–4 dentibus horizontalibus minute denticulata (intima lanceolata, acuta, in dimidio inferiore horizontaliter laciniato-dentata), *basi* \pm *truncata* ; *caulinum* 0–1, lineare, integrum ; omnia *utrinque floccosa* (subtus dense vel subtomentosa), marginibus parce et breviter ciliatis petiolisque floccosis molliter pilosis. Anthela furcato-corymbosa, 2–4-cephala, *pedunculis* gracilibus suberectis *floccosissimis glandulisque tenuibus obscuris sparsis* obsitis. Involucra mediocria, lata, inferne rotundata. *Squamae* in gemmis *porrectae, griseo-virides, latiusculae, lineari-lanceolatae, acutae, dense floccosae, pilis basi obscuris sparsis glandulisque brevibus vestitae. Ligulae apice glabrae. Styli lutei. Alveoli receptaculi margine argute dentati.*

Stem 20–35 cm. high, glabrate, striate, somewhat floccose above. *Radical leaves* spreading, rather small, thick, dull green *slightly spotted with purplish*, sometimes purpurascens beneath ; the primordial oval, rounded-obtuse-mucronulate, subentire, subtruncate below ; the later *oblong*, obtuse-mucronate to subacute, *subentire* or minutely denticulate *with 2–4 horizontal teeth at the base* (innermost lanceolate, acute, lacinate-dentate in the lower half with horizontal teeth), \pm *truncate-based* ; stem-leaf 0 or 1, linear, entire ; all *floccose on both surfaces* (densely so or subtomentose beneath), sparingly fringed with (generally short) pilose hairs, the petioles floccose and softly pilose. Inflorescence furcate-corymbose, 2–4-headed, with slender, suberect *peduncles*, which are *very floccose, with scattered, fine, dark glandular hairs*. Heads of medium size, broad, rounded below. *Phyllaries porrect in bud* ap. W. R. Linton, *greyish green*, rather broad, linear-lanceolate, acute, *densely floccose, with scattered dark-based pilose and short glandular hairs. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits sharply dentate* ap. W. R. Linton. Achenes reddish-brown, 3.5–4 mm. long.

This very distinct hawkweed, at first described as a variety *griseum* of *H. hypochaeroides* in W. R. Linton's 'British Hieracia', and said to be characterized by dull, grey-green foliage, seems to have been only cursorily examined. The fact that the grey-green colour of the leaves is due to the presence of abundant stellate hairs on both surfaces was overlooked, and there seems to be no sufficient reason for associating the plant with *H. hypochaeroides*. Apart from *H. Grovesii* Pugsl., of the Section *Alpina*, and *H. flocculosum* Backh., a member of the Cerinthoidean group, the only British phyllopodous species with similarly floccose foliage is *H. cymbifolium* Purchas, and with this *H. cillense* seems best treated as constituting a small separate subdivision *Stellatifolia* of the Section *Vulgata*. Not only in its floccose foliage but in its general habit, *H. cillense* shows an approach towards the French species, *H. stelligerum* Froel. It seems to be a rare plant in its sole known station. It was re-collected there by Roffey in 1925, but I failed to find it ten years later.

Distribution.—42. Brecon : Craig Cille (Ley).

Endemic.

92. *HIERACIUM CYMBIFOLIUM* Purchas in Journ. Bot. xxxvii. 421 (1899) ; Williams, l. c. 127 (1902) ; W. R. Lint. Brit. Hier. 52 (1905) ; *H. bifidum* subsp. *cymbifolium* Zahn, l. c. 422 (1921).

Icon.—Pl. 5, fig. b.

Exsicc.—Purchas, Buxton, 1898; Linton no. 112 (Cressbrook Dale); Cryer, Gordale, 1910; Ley, Littondale, 1887, and Heseldon Glen, 1902; all in Hb. Mus. Brit.

Stem 25–50 cm. *high*, robust, purplish-tinted below, sparingly pilose, becoming floccose above. *Radical leaves* thick, dull green, *often laterally incurved*; the primordial small, oval, subtruncate, subentire, cordate-based; the later *oblong*, often with nearly parallel sides, obtuse-mucronate or the inner acute, *denticulate* (sometimes obscurely), usually *becoming shortly sinuate-dentate about the cordate or subtruncate base*; stem-leaf 0 or 1, ovate, acuminate, \pm dentate, subcordate and subpetiolate, to narrow-lanceolate, entire or linear and bractlike; all \pm floccose on both surfaces, often densely so beneath, also \pm pilose, especially on the midrib beneath, with shortly ciliate margins and the long, purplish petioles softly villous. Inflorescence furcate- or subumbellate-corymbose, generally with a long lower branch from the axil of the cauline leaf, 3–12-headed, with rather short acladium and short, spreading peduncles, which are *densely floccose with numerous fine, dark glandular and pilose hairs*. Heads of medium size, broad, subtruncate-based. *Phyllaries incumbent in bud, dark green*, linear-lanceolate, mostly acute, *floccose*, especially on the margins, senescent, *with many dark glandular and longer, black-based pilose hairs* intermixed. *Ligules slightly pilose-tipped*. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes reddish-black, about 3.5 mm. long.

This well-marked species is a larger plant than *H. cillense*, with dull green, almost subentire radical leaves, which in the living plant are laterally incurved, imparting a boat-like outline, from which the specific name is taken. Its heads are broad and subtruncate-based, with relatively dark phyllaries.

Outside this Subsection, *H. basalticolum*, *H. pachyphyllum* and *H. sanguineum* show some resemblance to *H. cymbifolium*, but they lack the characteristic foliar floccum or possess it only to a relatively slight extent.

Distribution.—39. Stafford: Wetton Mill (Ley). 57. Derby: Miller's Dale! Cressbrook Dale! Chee Dale! Buxton (Purchas). 64. M.W. Yorks: Ingleborough! Littondale, etc. (Ley). Gordale (Cryer). Ribbleshead (Foggitt).

Endemic.

Subsection GLANDULOSA subsect. nov.

H. murorum * *silvaticum* Fries, Epicr. 91 (1862); *H. Vulgata-Subvulgata* W. R. Lint. Brit. Hier. 4 (1905) ex parte; *Eu-Vulgata* sp. coll. *H. murorum* Zahn, l. c. 287 (1921), pro maj. parte.

Plantae scapigeræ foliis \pm hirsutis involucrisque valde glandulosis præditæ.

Scapigerous plants, usually with \pm hirsute stem and foliage, with 0–1 stem-leaf (–2 in *H. duriceps*, *H. cuneifrons*, *H. pulcherrimum* and *H. longilobum*), which is often well-developed and petiolate. Radical leaves usually green and \pm truncate-based. Inflorescence paniculate- to furcate-corymbose. Heads very small, or small and narrow, to rather large and rounded below. Phyllaries (and generally peduncles) clothed entirely or predominantly with dark (paler in *H. prætenerum*), unequal, \pm strong glandular hairs (often also \pm floccose and pilose), generally incumbent in bud. Ligules often \pm radiant, glabrous- or more rarely pilose-tipped. Styles generally \pm livid. Margins of receptacle-pits usually \pm dentate but dentate-fimbriate in *H. ciliatiflorum*.

The plants of this Subsection are generally characterized by clear green foliage, more or less paniculate inflorescence, and heads of not more than moderate size, with phyllaries of which the glandular hairs form the most obvious clothing. They were formerly included under *H. murorum* L. by Backhouse and other earlier writers, and most of them are grouped as subspecies under that aggregate name by Zahn.

With the exception of the *Eu-Vulgata*, they are the most widely spread hawkweeds in Britain of all the phyllopodous groups, and are not confined to hilly and rocky habitats.

Thirteen species, of which four belong to the Series *Pellucida* and nine to the *Ciliatiflora*, are found in Scotland, and of these eight are confined to that country and six are believed to be endemic. Nine species (four of the *Ciliatiflora*), of which three are endemic, grow in the north of England. In southern England, Wales and Ireland species of the *Pellucida* only occur (3, 5 and 3 respectively). Three of these are not known outside the principality.

H. exotericum in its different forms grows freely on sandy or chalky banks and roadsides almost throughout the south of England. The three Irish species are uncommon and widely scattered.

Species of this group are often abundant in Central Europe. They occur also in Scandinavia.

Series *Pellucida* [Grex *H. pellucidum* Laest.].

Inflorescence paniculate-corymbose; heads small (less so in *H. cuneifrons*) and narrow (subcylindric), or very small.

* Heads with glandular and pilose hairs.

Leaves ovate-lanceolate, glaucous, spotted, glabrous above, \pm sharply dentate, subtruncate-based.	<i>H. praecox.</i>
Leaves oblong, green, \pm spotted, denticulate, \pm cuneate-based. Heads blackish green, narrowed below, very small. Ligules pilose-tipped.	<i>H. duriceps.</i>
Leaves oblong, unspotted, little toothed, subtruncate-based. Heads blackish green, \pm rounded below. Ligules pilose-tipped.	<i>H. killinense.</i>
Leaves oblong-obovate, unspotted, denticulate, subcuneate-based. Heads paler green, very small. Styles \pm yellow.	<i>H. praetenerum.</i>

** Heads normally epilose; leaves unspotted.

Leaves broadly oval, dark green, glabrate, toothed below, \pm truncate-based. Heads blackish green, very small.	<i>H. pellucidum.</i>
Leaves oblong, bright green, sparingly pilose, denticulate, rounded below. Heads dark green.	<i>H. stenstroemii.</i>
Leaves oval, yellowish or light green, pilose, \pm toothed and truncate-based. Heads pale to blackish green. Ligules glabrous- or pilose-tipped. Styles \pm yellow.	<i>H. exotericum.</i>
Leaves oval, green, \pm acute, serrate-dentate, \pm narrowed below. Heads of medium size, dark green. Styles yellow.	<i>H. cuneifrons.</i>
Leaves obovate, pale green, obtuse, denticulate, \pm truncate-based. Heads rather small, blackish green.	<i>H. pulcherrimum.</i>
Leaves elliptic, yellowish green, sinuate-serrate, subtruncate-based. Heads rather small, dark green, very slightly pilose. Styles fuscous.	<i>H. itunense.</i>

Series *Ciliatiflora* [Grex (valde polymorphus) *H. ciliatiflorum* Pugs.].

Inflorescence generally less paniculate; heads of moderate size (rarely rather large), rounded- or ovate-based.

* Heads epilose.

Leaves oblong-obovate, glaucous, obtuse, denticulate. Peduncles densely floccose. Heads rather large, blackish green, with short glandular hairs.	<i>H. pollinarium.</i>
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** Heads with glandular and pilose hairs.

† Ligules glabrous-tipped. Leaves glabrescent above.

Leaves oblong to ovate-lanceolate, denticulate to serrate, \pm truncate-based. Heads few, blackish green, with many pilose hairs. Phyllaries subperrect in bud. Styles \pm yellow.	<i>H. pictorum.</i>
Leaves broadly oval, glaucescent, denticulate, rounded below. Heads dark olive-green, with many pilose hairs. Styles yellow.	<i>H. pollinarioides.</i>

- Leaves oval to obovate, denticulate, \pm narrowed below. Heads greyish green, with few short pilose hairs. Styles yellow *H. caliginosum*.
 Leaves ovate-lanceolate, bluish green, denticulate, truncate-based. Heads dark green, with many long pilose hairs *H. subprasinifolium*.

†† Ligules pilose-tipped.

- Leaves oblong, caesious, sinuate-dentate, subtruncate-based. Heads dark green, with many pilose hairs *H. Pseudo-Stenstroemii*.
 Leaves lanceolate, deeply serrate, shortly narrowed below. Heads dark green, with few pilose hairs *H. longilobum*.
 Leaves oblong, serrate, with sagittate base. Heads dark green, with many pilose hairs. Styles yellow *H. semi-crassiceps*.
 Leaves oval, obtuse, slightly toothed, shortly narrowed below. Heads rather large, \pm dark green, with few or many pilose hairs. Styles \pm yellow. Margins of receptacle-pits dentate-fimbriate *H. ciliatiflorum*.
 Leaves oval, spotted, obtuse, denticulate, with rounded base. Heads normally rather small, dark green, generally with some pilose hairs in British plants *H. varicolor*.
 Leaves lanceolate, subacute, subentire, with cuneate base. Heads olive-green, with few long pilose hairs. Styles fuscous *H. dipteroides*.

Series **Pellucida**. (See page 135.)

93. **HIERACIUM PRAECOX** Schultz-Bipontinus in Pollichia, viii. 47 (1849) and ix. 35 (1851). *H. praecox* subsp. *praecox* Zahn, l. c. 237 (1921).

Icon.—Pl. 6, fig. a.

Exsicc.—Schultz-Bip. Cichor, no. 22, as var. *castanetorum*; Pugsley no. 419; both in Hb. Mus. Brit.

Stem 20–40(–60, cult.) cm. high, slender, very sparingly pilose and floccose. *Radical leaves* suberect, pale *glaucous* green, elegantly *variegated with purple* on the upper side and paler or sometimes clouded with violet beneath; the primordial oval, obtuse-mucronulate, subentire, rounded or subtruncate below; the later *ovate-lanceolate*, \pm acuminate, *subentire* above with shallow, spreading teeth towards the *subtruncate base*, or *sharply sinuate-dentate* with the basal teeth long and deflexed; stem-leaf usually 1, lanceolate or linear-lanceolate and deeply toothed, or smaller and bractlike; all *glabrous above*, pilose beneath and on the margins, and more strongly so on the long, slender petioles with soft, waved hairs. Inflorescence irregularly subcorymbose, 4–10-headed, with rather long, suberect peduncles, which are floccose with many long and short glandular hairs intermixed. *Heads small and narrow*, rounded below. *Phyllaries* incumbent in bud, *dark green*, linear-lanceolate, \pm acute, sparingly floccose, with dense, dark glandular and \pm numerous long, dusky pilose hairs. Ligules glabrous-tipped, the marginal long. Styles slightly livid. Margins of receptacle-pits dentate. Achenes nearly black, about 3 mm. long.

In Journ. Bot. iv. 223 (1866) C. H. Schultz-Bipontinus wrote a short note, entitled ‘*Hieracium praecox*, nova Florae Britannicae planta’, in which he stated that he had examined in Herb. Mus. Brit. specimens from Great Orme’s Head and Castle Dinas Bran belonging to this species. The specimens in question are mounted on one sheet, which bears his determination, dated 26 May, 1866. They are both single plants of small size, and now in poor condition. That from the Great Orme was subsequently named ‘*H. hypochaeroides* Gibs.’ by Ley, and has the appearance of that species. But as *H. hypochaeroides* has never been known from that station, it is not unlikely that the example may be a young individual of *H. britanniciforme*, which normally produces spotted leaves. The second specimen, which is evidently different from the first, may belong to *H. praecox*, but it is indeterminable in its present condition. No other specimens of *H. praecox* from Castle Dinas Bran seem to be known.

H. praecox was discovered in the railway cutting at Smitham Bottom, in Surrey, by Lt.-Col. Wolley Dod in 1920, and was in abundance there in 1922. In cultivation

it grows and seeds very freely, and is ornamental owing to its beautifully spotted foliage. As it had never been previously noticed in Surrey, and such a conspicuous plant could not well be overlooked, it may be presumed to be an accidental introduction in this locality, probably during the Great War. It seems to match precisely the *exsiccata* sent out by Schultz-Eipontinus (no. 22) as *H. praecox* var. *castanetorum*—‘Intense coloratum, foliis ovato-triangularibus acutis dentatis. Medium quasi *H. praecox* normale inter et *laciniatum*’, and agrees with Zahn’s description of his subspecies *praecox*, to which Schultz-Bip. no. 22 is cited. The varietal name is not noticed by Zahn. A similar plant was collected by Mr. G. T. Fraser in 1939, on a wall at Churston Ferrers, S. Devon.

Distribution.—17. Surrey : Smitham Bottom !

General Distribution.—Spain to Central Europe.

94. *HIERACIUM DURICEPS* F. J. Hanbury in Journ. Bot. xxx. 260 (1892); in Bab. Man. ed. 9, 257 (1904); Williams, l. c. 158 (1902); non W. R. Lint. Brit. Hier. 62 (1905), nec *H. bifidum* subsp. *duriceps* Zahn, l. c. 419 (1921).

Exsicc.—Hanbury, Oyke Bridge, 1890, (partim) in Hb. Hanbury; Hanbury, cult. 1894 (orig. Oyke Bridge), in Hb. Mus. Brit.

Stem 30–50 cm. high, normally slender, with scattered pilose hairs, becoming also flocculose above. *Radical leaves* few, dull green (sometimes spotted with purple ap. Hanbury); the primordial oval, rounded-obtuse-mucronulate, sinuate-denticulate, abruptly narrowed below; the later *oblong to lanceolate*, obtuse-mucronate to acute, *denticulate* or the inner shallowly sinuate-dentate towards the \pm *cuneate* base; stem-leaves 0–2, the lower lanceolate, acuminate, petiolate, sharply sinuate-dentate above the \pm truncate base, the upper, if present, linear and bractlike; all *pilose on both surfaces* with subsetiform hairs, with shortly ciliate margins and villous petioles. Inflorescence paniculate-corymbose, 2–6(–16, cult.)-headed, with short acladium and long, straight, slender, suberect lower branches, the peduncles floccose, with many long, dark glandular and a few pilose hairs. *Heads very small, narrowed below*. *Phyllaries* (incumbent) in bud, *blackish green*, rather broad, lanceolate-subulate, \pm acute, scarcely floccose, with dense, long and short, black glandular and many long, dark pilose hairs. *Ligules pilose-tipped*. Styles livid. Margins of receptacle-pits incise-dentate. Achenes dark brown, about 3.25 mm. long.

β . *camptopetalum* (Hanb.) comb. nov.

H. murorum var. *camptopetalum* Hanb. in Journ. Bot. xxxii. 228 (1894); in Bab. Man. ed. 9, 253 (1904).

Exsicc.—Hanbury, Allt-na-Caillich, 1888 (type), in Hb. Hanbury.

Radical leaves long-petioled, oval to obovate-lanceolate, finely denticulate throughout, nearly glabrous above. Peduncles with glandular but without pilose hairs. Heads stylose-flowered. Phyllaries more floccose than in the type, epilose. Otherwise like the type.

γ . *denticulatum* (W. R. Linton) comb. nov.

H. oxyodus var. *denticulatum* W. R. Lint. Brit. Hier. 42 (1905); *H. bifidum* subsp. *oxyodus* var. *denticulatum* Zahn, l. c. 430 (1921).

Exsicc.—Linton, Glen Lochay, 1891 (type), and cult. 1893 and 1897; in Hb. Mus. Brit.

Stem-leaf usually 1, linear-lanceolate, entire or finely toothed. Inflorescence with longer acladium and less spreading branches than in the type, sometimes \pm aggregate or subumbellate. Phyllaries less acute, with less dense glandular hairs. Otherwise as in the type.

This plant was first collected by Hanbury in 1888 near Altnaharra, in Sutherland, and in 1890 at Oyckell Bridge, where he obtained a 'finer series' of specimens. His herbarium apparently contains no examples from Altnaharra, but it has three sheets, with seven specimens, from Oyckell Bridge. At a glance these seven specimens seem homogeneous, but they are really not so, three being a form near *H. pellucidum* Laest., and four much like the Yorkshire plant described as *H. duriceps* var. *cravoniense* Hanb. Hanbury's original description was evidently taken from the *pellucidum*-like plant, which was the form that he cultivated in his garden, and this plant is regarded as the true *H. duriceps* and described accordingly. Hanbury's remaining specimens from Oyckell Bridge, like the *exsiccata* sent out by Messrs. Linton under the name of *H. duriceps* (no. 144), are distinct plants with narrower, deeply cut leaves and heads strongly pilose and very slightly glandular. They are connected with var. *cravoniense*, which is here treated as a separate species belonging to the Subsection *Caesia*.

Typical *H. duriceps* is apparently known only from Oyckell Bridge. Its heads closely resemble those of *H. pellucidum* although there is an admixture of pilose among the glandular hairs, but its foliage is widely different.

Distribution.—107. E. Sutherland : Oyckell Bridge (Hanbury).

var. *camptopetalum*.

108. W. Sutherland : Allt-na-Caillich (Hanbury).

var. *delicatulum*.

88. Mid Perth : Glen Lochay (Linton).

Endemic.

95. *HIERACIUM KILLINENSE* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. murorum subsp. *killinense* Zahn, l. c. 338 (1921); *H. silvaticum* var. *micracladium* Williams, l. c. 134 (1902); W. R. Lint. Brit. Hier. 40 (1905); *H. murorum* var. *micracladium* Hanb. in Bab. Man. ed. 9, 253 (1904); non *H. micracladium* Dahlst.

Exsicc.—Linton no. 17 (Killin and Moffat) and no. 169 (Chapel-le-Dale); Linton, Unich Water, 1889; Marshall nos. 2334 A, 3074 and 3454; Ley, Ingleton and Dent Dale, 1902; all in Hb. Mus. Brit. as var. *micracladium*.

Stem 20–45 cm. high, slender, glabrescent below, becoming somewhat floccose above with \pm numerous fine, dark glandular and some black-based pilose hairs. *Radical leaves* generally few, *pale green*; the primordial small, oval, rounded-obtusely-mucronulate, subentire or denticulate, and subtruncate below; the later *oblong* to oblong-lanceolate, obtuse-mucronulate or the innermost \pm acute, *subentire*, remotely denticulate or sinuate-dentate with very shallow teeth towards the *rounded*, *subtruncate* (often asymmetrical) or *shortly narrowed base*; stem-leaf usually 1, placed high, lanceolate, toothed or not; all clothed with *scattered short hairs on both surfaces* or \pm glabrate, with soft pilose hairs on the midrib beneath and on the petioles, the margins ciliate. Inflorescence irregularly paniculate- or sub-corymbose, 5–10(–15)-headed, with slender, curved branches exceeding the short accladium, the peduncles \pm floccose, with numerous dark glandular and a few dark pilose hairs. *Heads small and narrow, scarcely rounded below*. *Phyllaries* incumbent in bud, *blackish green*, linear-lanceolate, acute, very sparingly floccose, densely clothed with long and short, dark glandular hairs, with \pm numerous long, dark pilose hairs intermixed. *Ligules pilose-tipped*. Styles livid. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3 mm. long.

The British plants from Killin and Moffat, sent out by Messrs. Linton as no. 17 of their set of *exsiccatae*, are characterized by a considerable quantity of pilose hair among the glandular hair of the phyllaries, and apparently on this ground they were.

separated from *H. microcladium* Dahlst. by Zahn (l. c.) as a new subspecies *killinense*. Dahlstedt's *H. microcladium*, as shown by his *exsiccatae* H. Sc. xvii. 23, xvii. 24 and xix. 62, has no pilose hair on the involucre or peduncles, the hair-clothing being entirely glandular. In Zahn's Monograph the subspecies *microcladium*, based on Dahlstedt's specimens, for he furnished no description, appears as British in addition to the subspecies *killinense*, but no British specimens matching the former have been observed. In examining the herbarium material at Kew and in Herb. Mus. Brit. it was found that all the British examples passed as *microcladium* possess more or less numerous pilose hairs on the involucre, and often some on the peduncles, and they are therefore not identical with Dahlstedt's own specimens and appear all referable to Zahn's new subspecies *killinense*.

H. killinense is also allied to *H. duriceps* and has similarly pilose-tipped ligules. It is best distinguished by its larger and less cuneate-based heads.

In Journ. Bot. xxx. 259 (1892) Hanbury published a new variety *pulcherrimum* of *H. murorum*, founded on specimens collected at Catterick Force, near Settle, and afterwards on Carnedd Dafydd. The two plants (in Herb. Hanbury) are not identical, as was noticed by Elfstrand, and the brief description is evidently taken largely from the Settle material, which proves to be unusually fine *H. killinense*.

H. serratifrons subsp. *morulum* Dahlst. is admitted as a British plant by W. R. Linton (Brit. Hier. p. 47) and by Zahn. The *exsiccata* Dahlst. H. Sc. ix. 42, under this name, closely resembles *H. killinense*, differing in its sharply though not deeply toothed leaves and its almost wholly glandular heads. The Ben Hope plant, cited by Linton, does not match this specimen, and no other British material has been seen that can be referred to it.

Distribution.—60. W. Lancs : Easegill (Wilson). 64. M.W. Yorks : Settle (Hanbury). Ingleton (Ley). 65. N. W. Yorks : Dent Dale (Ley). 69. Westmorland : Maizebeck (E. G. Baker). 72. Dumfries : Moffat (Marshall). 75. Ayr : Largs (Boyd). 83. Edinburgh : Arniston (Syme). 86. Stirling : Denny (Stirling). 88. Mid Perth : Killin ! Glen Lochay (Linton). Ben Laoigh (Marshall). 89. E. Perth : Blairgowrie (Marshall). 90. Forfar : Clova (Linton). 92. S. Aberdeen : Glen Callater (Linton). 97. W. Inverness : Linn of Puttack (Hanbury). Moidart (Macvicar). 104. N. Ebuies : Eigg (K. B. Blackburn). 106. E. Ross : Aultguish (Marshall). Strath Garve (Shoolbred). 107. E. Sutherland : Oyckell Bridge (Hanbury). 108. W. Sutherland : Bettyhill (Linton). Farr (Marshall). Altnaharra (Hanbury).

Ireland.—14. Leix : Maryborough (Praeger). 38. Down : Tollymore (Waddell). 39. Antrim : Sallagh Braes (Stewart). Torr Head (Praeger). 40. Londonderry : Garvagh (Brennan).

Endemic.

96. *HIERACIUM PRAETENERUM* Almquist ex. Dahlstedt, Bidrag, ii. 153 and 158 (1893); W. R. Lint. Brit. Hier. 55 (1905); *H. ciliatum* var. *praetenerum* Williams, l. c. 141 (1902); *H. proximum* Norrlin, Herb. Mus. Fenn. ii. 151 (1889), non F. J. Hanbury in Journ. Bot. xxvii. 76 (1889); *H. murorum* subsp. *proximum* Zahn, l. c. 336 (1921).

Exsicc.—Dahlstedt, H. Sc. i. 74, 75 and 76; iv. 22; xvii. 64; all in Hb. Kew; Hanbury, Ennerdale (cult.), 1889? in Hb. Mus. Brit.; Dahlst. H. Exs. ii. 39 and 40; iv. 62; all in Hb. Hanbury.

Stem 30–50 cm. high, rather slender, glabrescent below, ± flocculose with very rare glandular hairs above. *Radical leaves pale green*; the primordial oval to obovate-oblong, rounded-obtuse-mucronate, subentire, abruptly narrowed below; the later (sometimes large) *oblong-obovate*, oblong or the innermost lanceolate, rounded-obtuse or obtuse-mucronate, or the inner acute, *denticulate* towards the apex with rather

shallow, broad, *spreading teeth below*, the lowest pair sometimes sharp and horizontal, all *shortly cuneate-based* or \pm abruptly narrowed to the rather short petioles; stem-leaf 0 or more often 1, lanceolate, acute, sharply and deeply dentate towards the base, or smaller and linear; all *sparingly pilose on both surfaces*, with ciliate margins and \pm villous petioles. Inflorescence paniculate-corymbose, the upper part sometimes subumbellate, 3-12(-many, cult.)-headed, with slender, incurved peduncles which are sparingly flocculose with numerous fine glandular hairs. *Heads small and narrow* (sometimes very small), rounded-based. *Phyllaries* porrect in bud ap. W. R. Linton, *pale green* with darker base, narrow, linear-lanceolate, acute, scarcely floccose, with numerous fine, unequal, dusky glandular and some longer pilose hairs. Ligules glabrous-tipped. *Styles yellow or rarely livescent*. Margins of receptacle-pits shortly dentate. Achenes small, blackish, about 2.5 mm. long.

The features of this species, which has rarely been collected in Britain and even then not in a typical form, are its more or less obovate and slightly toothed radical leaves and its panicle of small, or very small, pale green heads, with narrow, acute phyllaries thickly clad with fine, dusky glandular hairs. The achenes are remarkably small in the specimens examined. Fox's original wild specimen collected in Ennerdale in 1888 (in Herb. Hanbury) has darker and less glandular heads than the typical Scandinavian plant, and looks less like it than the cultivated example from Hanbury's garden, now in Herb. Mus. Brit.

Distribution.—70. Cumberland: Ennerdale (Fox)? 88. Mid Perth: Aberfeldy (Fisher)?

General Distribution.—Scandinavia.

97. *HIERACIUM PELLUCIDUM* Laestadius in K. Sv. Vet.-Ak. Handl. 172 (1824); Wahlb. Fl. Suec. ii. 194 (1826); Ley in Journ. Bot. xlvii. 13 (1909), pro maj. parte; *H. melanolepis* Almq. ex Norrl. Bidrag, i. 87 (1888); *H. murorum* var. *lucidulum* Ley in Journ. Bot. xxxviii. 3 (1900); *H. pellucidum* var. *lucidulum* W. R. Lint. Brit. Hier. 43 (1905), pro maj. parte; *H. murorum* subsp. *pellucidum* Zahn, l. c. 288 (1921). *Icon*.—Pl. 6, fig. b.

Exsicc.—Dahlstedt, H. Sc. i. 31 and 32, as *H. melanolepis*, in Hb. Kew; Ley, Dyffryn Cwannon, 1894; Ingleborough, 1902; and Craig Rhiwarth, 1904; Wilmott no. 2059 (Hambleton); all in Hb. Mus. Brit.

Stem 30-55 cm. high, erect, nearly glabrous below, becoming \pm floccose above. *Radical leaves* rather firm, shining above, *dark green*, rarely with a few purplish spots, often purpurascant beneath; the primordial small, subrotund-oval, rounded-obtusely-mucronulate, subentire and rounded below; the later (very variable in size) *broadly oval* to oblong-ovate, rounded-obtusely-mucronulate to subacute, *distantly denticulate* and \pm *sinate-dentate* below, or with horizontal, sagittate, or even deflexed (sometimes sharp) teeth about the *rounded, truncate* (often asymmetrically) or *cordate* base; stem-leaf 0 or 1, ovate-cordate, acuminate, \pm toothed, petiolate, or smaller and more bractlike; all *nearly glabrous above*, sparingly pilose beneath and on the margins, with \pm villous petioles. Inflorescence paniculate-corymbose and sometimes subumbellate above, 3-20(-50, cult.)-headed, with short accladium and straight, slender and sometimes spreading branches, the peduncles floccose, with numerous dark glandular hairs. *Heads small or very small*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-lanceolate, acute, sparingly floccose, with dense dark glandular hairs, *epilose*. Ligules glabrous- or \pm pilose-tipped. Styles livid. Margins of receptacle-pits shortly dentate. Achenes blackish, slender, 3-3.5 mm. long, with conspicuously white pappus.

β. lucidulum W. R. Linton, emend.

H. pellucidum var. *lucidulum* W. R. Lint. Brit. Hier. 43 (1905), pro min. parte ; *H. pellucidum* Ley in Journ. Bot. xlvii. 13 (1909), pro min. parte ; *H. murorum* subsp. *lucidulum* Zahn, l. c. 318 (1921).

Exsicc.—Linton no. 139 (Craig Cille), in Hb. Mus. Brit.; Pugsley, Craig Cille, 1935, in Hb. Pugsley.

Leaves sometimes floccose beneath. Heads rather larger than in the type. Phyllaries ± floccose-edged, densely clothed with glandular intermixed with ± numerous pilose hairs. Otherwise like the type.

H. pellucidum is a widely spread species in England and Wales, occurring also in Ireland, and shows but little range of variation. Its salient features are the glabrate, dark green, more or less truncate-based leaves, often purpurascens beneath, and the panicle of small, dark heads with densely glandular phyllaries and livid styles. In fruit the white pappus is often conspicuous. The variety *lucidulum*, treated as a separate subspecies by Zahn, differs mainly in its rather larger heads, with more floccose phyllaries which develop some pilose among the glandular hairs.

Distribution.—21. Middlesex : Enfield (Trimen). 22. Berks : Upton (Druce). 23. Oxford : Henley (Druce). 34. W. Glo'ster : Stroud (Day). Tidenham (Shoolbred). 35. Monmouth : Pont y Saison (Shoolbred). 36. Hereford : Hatterels (Ley). 41. Glamorgan : Craig-y-llyn (Riddelsdell). 42. Brecon : Dyffryn Cwannon (Ley). Craig Cille ! 43. Radnor : Aberedw (Roffey). 44. Carmarthen : Llangadoc (Ley). 57. Derby : Matlock ! Miller's Dale ! 60. Mid Lanes : Silverdale (Cryer). 62. N. E. Yorks : Thirsk (Foggitt). Sutton Bank ! Hambleton (Wilmott). 64. M.W. Yorks : Ingleton ! Heseldon Glen ! Ribblesdale (Ley). Wharfedale ! 66. Durham : High Force, Teesdale ! 69. N. Lanes : Windermere (Foggitt). Ambleside (Linton).

Ireland.—20. Wicklow : Baltinglass (Brunker). 38. Down : Grey Abbey (Waddell). Hillsborough (Knowles).

var. *lucidulum*.

42. Brecon : Craig Cille ! Pwll Byfre (Riddelsdell). 64. M.W. Yorks : Ingleton !

General Distribution.—Scandinavia. Russia, etc.

98. *HIERACIUM STENSTROEMII* Dahlstedt in Svensk Vet.-Akad. Handl. xxv. 3, 86 (1893) ; *H. serratifrons* subsp. *Stenstroemii* Dahlst. Bidrag, ii. 86 (1893) : *H. murorum* subsp. *Stenstroemii* Zahn, l. c. 292 (1921), excl. British localities.

Exsicc.—Dahlstedt H. Sc. i. 33, 34 and 35 ; ix. 43 ; all in Hb. Kew.

Stem 40–60 cm. high, rather slender, nearly glabrous below, becoming floccose with scattered fine, dark glandular hairs above. *Radical leaves* thin, *bright green* ; the primordial small, subrotund or oval, rounded-obtuse-mucronulate, minutely denticulate, subtruncate below ; the later large, *oblong* to ovate-lanceolate, obtuse-mucronate to acute, *glandular-denticulate*, often with shallow, undulate (occasionally sharp) teeth towards the *rounded or subtruncate base* ; stem-leaf 0 or 1, oval-lanceolate, acuminate, with fine, sharp teeth near the base and sometimes continuing down the petiole ; all *sparingly pilose* on both surfaces and the margins, and but little more shaggy on the long petioles. Inflorescence laxly paniculate-corymbose, sometimes with a long lower branch, 3–12-headed, with slender, incurved peduncles, which are floccose with many dark glandular hairs. *Heads rather small and narrow*, rounded below. *Phyllaries* (incumbent) in bud, *dark green*, linear-lanceolate, mostly obtuse, ± floccose towards the base, densely clad with unequal, dark glandular hairs, *epilose*. Ligules glabrous-tipped. Styles dark. Margins of receptacle-pits Achenes blackish, about 3 mm. long.

β. subcordatum var. nov.

H. sparsidens var. *elatus* Ley in Journ. Bot. xlviii. 326 (1910) ?

Exsicc.—Ridley, Capel-y-ffin, 1882 (partim-type); Roffey, eodem loco, 1920 ; both in Hb. Mus. Brit.

Folia radicalia ± anguste oblonga, denticulata, subcordata vel raro subtruncata. Styli lutei. Achaenia 3·5 mm. longa. Aliter ut in typo.

Radical leaves ± narrowly oblong, denticulate, subcordate or rarely subtruncate. Styles yellowish. Achenes 3·5 mm. long. Otherwise like the type.

Typical *H. Stenstroemii* is not known as a British plant, and our hawkweed so named from Yorkshire is dealt with separately under a new name. There is a form, however, in Wales that may be placed under *H. Stenstroemii* as a variety.

In 1910 a variety *elatus* of *H. sparsidens* Dahlst. was published by Ley (Journ. Bot. xlviii. 326), who stated that his plant was considered by Dahlstedt to approach *H. Stenstroemii* and *H. sparsidens*. It was found in two localities in Brecon, Taffechan and Capel-y-ffin. In 1920 Roffey obtained at the latter station what he thought to be this variety *elatus*, but his specimen, which resembles *H. Stenstroemii*, is entirely different from an example sent out by Ley, collected at Taffechan, which appears to belong not to this generic subsection but to the *Eu-Vulgata*. There is also in Herb. Mus. Brit. an earlier gathering, showing two plants found by Ridley in 1882 at Capel-y-ffin, one of which agrees with Roffey's specimen and the other with Ley's from Taffechan. It thus seems certain that two different plants grow at Capel-y-ffin. Ley's description of *H. sparsidens* var. *elatus* shows more agreement with Roffey's plant from Capel-y-ffin than with his own from Taffechan, and it is difficult to believe that this latter form was that which Dahlstedt saw and considered near to *H. sparsidens* and *H. Stenstroemii*. If the plant sent to him was identical with that collected by Roffey, such a determination would not be unreasonable. There has probably been some confusion or admixture of specimens. The Capel-y-ffin plant is now described as a variety of *H. Stenstroemii*, as it appears more closely allied to that species than to *H. sparsidens*.

Distribution.

var. *subcordatum*.

42. Brecon : Capel-y-ffin (Ridley and Roffey).

General Distribution (of the species).—Sweden, Norway.

99. *HIERACIUM EXOTERICUM* Jordan ap. Boreau, Fl. Centre, ed. 3, ii. 417 (1857) ; Sudre, Hier. Centr. Fr. 74 (1902) ; *H. murorum* subsp. *exotericum* Zahn, l. c. 315 (1921) ; *H. serratifrons* Williams, l. c. 144 (1902) ? *H. pellucidum* W. R. Lint. Brit. Hier. 43 (1905) ;

Icon.—Sudre, Hier. Centr. Fr. pl. xxiii.

Exsicc.—Linton no. 37 (Godalming), as *H. pellucidum* ; Sudre H. H. ii. 68 ; Salmon, Caterham, 1906 ; C. E. Britton no. 1676 ; Riddelsdell, Machen, 1909 ; all in Hb. Mus. Brit.

Stem 30–80 cm. high, striate, robust or slender, pilose throughout and somewhat floccose, with ± numerous glandular hairs above. *Radical leaves* thin, light or yellowish green ; the primordial small, oval, rounded-obtuse-mucronulate, subentire or denticulate, abruptly narrowed below ; the later (often large) *oval to oblong*, obtuse-mucronulate to acute, denticulate towards the apex and ± *sinuate-dentate* below, often with broad, apiculate, or coarse, obtuse teeth, increasing in size to the *cordate, truncate or rounded base*, when the lowest (usually narrower) are sometimes deflexed or reversed ; stem-leaf normally 1, ovate-lanceolate, acuminate, sharply and often

deeply toothed, petiolate; all \pm *softly pilose* on both surfaces and shortly ciliate, with villous petioles. Inflorescence paniculate-corymbose, 5–20-headed, with generally a short accladium and slender, often incurving peduncles, also sometimes 1–2 longer lower branches; peduncles floccose and densely clothed with glandular hairs. *Heads small, rather narrow* or cylindrical, usually rounded below. *Phyllaries* incumbent in bud, *dull green* with paler margins, linear-lanceolate, rather narrow, acute, sparingly floccose, densely clothed with long and short, dark glandular hairs, *epilose*. *Ligules glabrous- or more rarely pilose-tipped*. *Styles yellowish*. Margins of receptacle-pits shortly subulate-dentate. Achenes blackish, about 3 mm. long.

f. *grandidens* (Dahlst.) comb. nov.

H. grandidens Dahlst. Bidrag, ii. 129 (1893); Ley in Journ. Bot. xlvii. 14 (1909); *H. murorum* subsp. *grandidens* Zahn, l. c. 314 (1921); *H. macrodon* Sudre, Bull. Ass. Pyr. 248 (1899) ?

Icon.—Zahn l. c. fig. 28, c. ₁₋₂.

Exsicc.—Zahn No. 735; Dahlst. H. Sc. xx. 99; both in Hb. Kew; Dahlst. H. Exs. i. 54 and 55; Marshall nos. 3760 and 4363; Riddelsdell, Wyndeliff, 1915; all in Hb. Mus. Brit.

Leaves often more deeply toothed and more pilose than in the type. Styles livid.

β *sublepistoides* (Zahn) comb. nov.

H. serratifrons subsp. *lepistoides* Dahlst. Bidrag, ii. 92 (1893); Williams, l. c. 145 (1902); W. R. Lint. Brit. Hier. 45 (1905); *H. murorum* subsp. *lepistoides* var. *sublepistoides* Zahn, l. c. 298 (1921); *H. gentile* Jord. ap. Bor. l. c. 415 (1857) ? *H. murorum* var. *genuinum* Syme, Eng. Bot. ed. 3, v. 191 (1866); *H. torticeps* Ley in Journ. Bot. xlvii. 14 (1909) pro parte, non Dahlst. Bidrag, ii. 128 (1893).

Icon.—Eng. Bot. ed. 3, t. 846, as *H. murorum*.

Exsicc.—Linton no. 38 (Witley); Marshall no. 1823; Linton, Ashwood Dale, 1898; Riddelsdell, Buckholt Wood, 1912; all in Hb. Mus. Brit.

Radical leaves often more elongate (oblong-lanceolate) and less obtuse than in the type, with broad, shallow, apiculate teeth, or a few sharper about the \pm truncate base, never coarsely and deeply dentate; often glabrescent above and less pilose beneath than in the type, with slenderer and less villous petioles. Inflorescence sometimes more elongate, with normally very small and dark heads. Styles \pm yellow.

γ . *Cinderella* (Ley) comb. nov.

H. serratifrons var. *Cinderella* Ley in Journ. Bot. xlv. 109 (1907), and xlvii. 14 (1909).

Exsicc.—Ley, Hay Mill, 1907, and Symond's Yat, 1908; Marshall no. 3878; all in Hb. Mus. Brit.

Radical leaves resembling those of the type in form, but with \pm shallow, sharp, serrate-dentate teeth. Heads \pm pale green, cuneate-based, with very long and narrow, acute, phyllaries. Ligules \pm pilose-tipped. Styles yellow or livescent.

δ . *candelabrae* (W. R. Lint.) comb. nov.

H. candelabrae W. R. Lint. Brit. Hier. 43 (1905), excl. Scottish localities; *H. murorum* subsp. *candelabrae* Zahn, l. c. 297 (1921).

Exsicc.—Linton no. 170 (Ingleborough) (type); Ley, Great Doward, 1905, as *H. serratifrons* var. *crassiceps*; both in Hb. Mus. Brit.

Stem robust. Radical leaves glabrescent above, often purple-tinted beneath, broadly oval, obtuse-mucronate or the innermost acute, denticulate towards the apex and with shallow, sharp, mucronate teeth below, the pair next the rounded-truncate base often longer and deflexed; stem-leaves often 2, the lower petioled, resembling the inner basal but more deeply dentate. Inflorescence corymbiform (often closely), many-(–20)-headed, the peduncles with dense, dark glandular hairs. Heads of moderate size, very dark. Phyllaries linear-lanceolate, mostly subacute, senescent, with dense, blackish glandular hairs, nearly epilose. Styles livid.

ε. *glevense* var. nov.

Exsic.—Riddelsdell, Chalford, 1920 (type), as *H. serratifrons* var. *crassiceps*; Riddelsdell, Cranham, 1912; both in Hb. Mus. Brit.

Folia radicalia ovalia vel ovato-oblonga, ±acuta, dentibus apiculatis haud altis sinuato-dentata, longe petiolata, basi rotundata vel cordata. Involucra satis parva, squamis lineari-lanceolatis, obtusis, atroviridibus, glandulis nigris dense vestitis, epilosis, vix floccosis praedita. Ligulae apice leviter pilosae. Styli lutei.

Radical leaves oval or ovate-oblong, ±acute, sinuate-dentate with shallow, apiculate teeth, long-petioled, with rounded or cordate base. Heads rather small, with linear-lanceolate, obtuse, blackish green phyllaries, which are densely clothed with black glandular hairs, epilose and scarcely floccose. Ligules slightly pilose-tipped. Styles yellow.

Several allied forms have been here brought together under *H. exotericum* Jord. as the earliest valid specific name. They are all characterized by light green, more or less pilose and truncate-based foliage, and by numerous small and narrow heads with densely glandular, epilose phyllaries. Their styles vary from pure yellow to dark livid, and their ligules are sometimes glabrous, sometimes pilose-tipped. Plants with these features are common in France and Central Europe, and in Britain are found chiefly in the southern half of England and Wales. They have been most generally treated by authors under the name of *H. murorum* L., but as shown in the introduction, it is not possible to apply this name accurately in a segregate sense, for not only is Linnæus's original description (Sp. Pl. 802) vague, but the fragmentary specimens in the Linnæan Herbarium and in Hortus Cliffortianus are evidently not conspecific. One example in the latter collection resembles *H. pellucidum* Laest. A good specimen there, labelled 'Hieracium, idem ut 31, altius folio longiore et ramosius (paniculatum)' is *H. exotericum* v. *sublepistoides*. *H. paniculatum* L. is a North American species. A very early British record for *H. exotericum* occurs in Johnson's edition of Gerard's 'Herball' (1633), where it is clearly figured as *Pulmonaria gallica sive aurea latifolia*. Johnson writes (p. 304) 'I received some plants of this from Mr. John Goodyer, who first found it on May 27, 1631, in floure and the three of the following May, not yet floureing, in a copse in Godlemen, in Surrey, adjoining to the orchard of the Inne whose sign is the Antilope.'

The variety *candelabrae* has larger heads than the other forms of *H. exotericum* and would possibly be better placed under the next species, *H. cuneifrons* (Ley).

The Forfar plant referred to *H. serratifrons* var. *crassiceps* in W. R. Linton's 'British Hieracia', p. 46, appears from the material in Herb. Linton (now in Herb. Mus. Brit.) to be distinct from *H. crassiceps* Dahlst., and it is now described as a new species, *H. semi-crassiceps*. *H. crassiceps* (Dahlst. H. Sc. i. 62 and xi. 18) is characterized by green, very truncate-based leaves with large, serrate teeth, and medium-sized heads with numerous dark pilose as well as glandular hairs. It could not be placed under *H. exotericum* Jord.

The form from Gloucestershire referred to var. *crassiceps* by Riddelsdell and described above as var. *glevense* (Gleva=Gloucester) differs widely from *H. crassiceps* in the possession of the narrow, wholly glandular heads characteristic of *H. exotericum*.

H. grandidens subsp. *torticeps* Dahlst., introduced to the British list by Ley (l. c.) seems to have been wrongly identified. Authentic material in Herb. Kew (Dahlst. H. Sc. v. 32, and xvi. 92) shows the salient features of *H. torticeps* to be its rather narrow, deeply serrate and cuneate-based leaves. The British specimens labelled '*H. torticeps*' are generally forms of var. *sublepistoides*.

Hanbury's variety *pulcherrimum* (Journ. Bot. xxx. 259) is treated here as a separate species.

In Herb. A. Bennett (now in Herb. Mus. Brit.) there is a plant from Smoo Cave, Sutherland, annotated '*H. murorum* **crassiusculum* Alm. ap. Almquist', and another in Herb. Hanbury from Lochinver is similarly named. These plants were included by W. R. Linton in his *H. candelabrae*, but they differ from the Yorkshire

form in having broader, less cut foliage and broader, much less glandular heads. They are therefore separated as another new species, *H. pollinarioides*.

A further allied form, *H. serratifrons* subsp. *morulum* Dahlst., shown in 'British Hieracia' p. 47, as inhabiting Scotland and Wales, does not appear to be British, as remarked under *H. killinense*.

Specimens in Herb. Druce from Steeple Aston, Oxford, shown in B. E. C. Report, viii. pt. 1, 28 (1927), as nearly related to *H. integratum* Dahlst., are dwarf individuals of *H. exotericum* var. *sublepistoides*. I have collected a similar form near Henley.

The plant from Kingsdown, in Kent, reported as *H. silvularum* Jord. in B. E. C. Report, ix. pt. 5, 560 (1932) belongs to the species *H. exotericum*.

Distribution.—1. W. Cornwall: Falmouth (Davey). 2. E. Cornwall: Upton (Harvey). 6. N. Somerset: Mells (A. E. Ellis). 13. W. Sussex: Lurgashall (Burdon). 14. E. Sussex: Withdean (Hilton). 15. E. Kent: Kingsdown (Lady Granville). 16. W. Kent: Langton (H. C. Pugsley). 17. Surrey: Witley (Marshall). Caterham! Mickleham! Boxhill! Compton! E. Horsley! 22. Berks: Wellington College (Monckton). 24. Bucks: Painesend (Lousley). 33. E. Glo'ster: Painswick (Riddelsdell). Lypiatt Wood (Miss Armitage). 34. W. Glo'ster: Amberley (Riddelsdell). Dursley (Brookes). 35. Monmouth: Machen (Riddelsdell). 36. Hereford: Great Doward! 41. Glamorgan: Aberdare, Lisvane, &c. (Riddelsdell). 42. Brecon: Abercran (Ley). 47. Montgomery: Forden (J. Bedford). 50. Denbigh: Bodnant (A. B. Jackson). 57. Derby: Deepdale (F. T. Hall).

Ireland.—38. Down: Hillsborough (Knowles).
f. *grandidens*.

4. N. Devon: Molland and Twitchen (Hiern). S. Molton (Foggitt). E. Anstey (Marshall). 5. S. Somerset: Dulverton (Marshall). 11. S. Hants: Winchester (Rayner). 16. W. Kent: Hever! 17. Surrey: Coldharbour (Wallace). 22. Berks: Streatley (Lousley). 33. E. Glo'ster: Cirencester (Price). 34. W. Glo'ster: Amberley (Foord-Kelsey). 35. Monmouth: Wyndcliff! 36. Hereford: Titley (Ley). 40. Shropshire: Marshbrook (Bickham). 57. Derby: Ashwood Dale (Linton). 80. Roxburgh: Abbotsford (Burdon). 86. Stirling: Thornhill (Miss Todd).

Ireland.—37. Armagh: Armagh (Hart). 38. Down: Saintfield (Waddell).
var. *sublepistoides*.

2. E. Cornwall: Doublebois (Harvey). 3. S. Devon: Dartmouth! Yelverton (Miss Todd). Shaugh Bridge (Briggs). 4. N. Devon: Little Torrington (Hiern). 7. N. Wilts: Bowood (Grose). 8. S. Wilts: Etchilhampton Hill (Grose). 11. S. Hants: Winchester! 12. N. Hants: Petersfield (Rayner). 14. E. Sussex: Withdean and Preston (Hilton). 16. W. Kent: Hever! 17. Surrey: Coldharbour! Witley (Burdon). Bookham (Wallace). Dorking (Lousley). Leatherhead! 20. Herts: Tring! 22. Berks: Henley! 23. Oxford: Goring (Riddelsdell). 24. Bucks: Amersham (Druce). 32. E. Glo'ster: Painswick, Cranham and Bussage (Riddelsdell). 34. W. Glo'ster: Nailsworth (Riddelsdell). Stroud (Bickham). Symond's Yat! 35. Monmouth: Wyndcliff! Abergavenny (Riddelsdell). 36. Hereford: Titley (Ley). Great Doward! 37. Worcester: Malvern (Towndrow). 38. Warwick: Badderley Clinton (Bagnall). 40. Shropshire: Much Wenlock (Painter). 41. Glamorgan: Radyr and Llandaff (Riddelsdell). 42. Brecon: Erwood (Roffey). 43. Radnor: Boughwood and Aberedw (Riddelsdell). 49. Carnarvon: Gwydyr Castle! 57. Derby: Ashwood Dale (Linton). 64. M.W. Yorks: Boston Spa (Pickard). 69. Westmorland: Arnside (Oliver).

Ireland.—5. E. Cork: Fota (Phillips). 8. Limerick: Adare (Knowles).
var. *Cinderella*.

34. W. Glo'ster: Coldwell Rocks (Riddelsdell). Symond's Yat (Ley). 41. Glamorgan: Glyn Neath and Perddyn (Riddelsdell). 42. Brecon: Glyn Collwng (Roffey).

Ireland.—2. N. Kerry : Killarney (Scully).

var. *candelabrae*.

36. Hereford : Great Doward (Ley). 64. M.W. Yorks : Ingleborough (Ley).

var. *glevense*.

33. E. Glo'ster : Cranham (Riddelsdell). 34. W. Glo'ster : Chalford (Riddelsdell).

General Distribution (of the species).—From Spain through Central Europe! to Central Russia.

f. *grandidens*.—Central Europe, Sweden.

var. *sublepidoides*.—Pyrenees, Austria, Germany.

vars. *Cinderella*, *candelabrae* and *glevense*.—Endemic.

100. *HIERACIUM CUNEIFRONS* (Ley) Pugsley in Journ. Bot. lxxix. 183 (1941).

H. subulatidens var. *cuneifrons* Ley ex W. R. Lint. Brit. Hier. 48 (1905);

H. murorum subsp. *subulatidens* var. *cuneifrons* Zahn, l. c. 318 (1921).

Exsicc.—Ley, Craig Cille, 1897 (type); Linton no. 138 (Craig Cille) as *H. murorum* var. *pulcherrimum*; Ley, Black Mt., 1898, and Taren-yr-Esgob (1901); all in Hb. Mus. Brit.

Stem 30–80 cm. high, \pm robust, slightly pilose below and \pm floccose, with numerous fine, dark glandular hairs above. *Radical leaves bright green*, not numerous; the primordial oval, rounded-obtuse-mucronulate, denticulate, with rounded or subtruncate base; the later (usually large) oval, *subacute to lanceolate, acute*, denticulate towards the apex and becoming (especially the innermost) distantly and *sharply serrate-dentate*, with the longest and sharpest teeth near the *shortly cuneate base*; stem-leaves (0–)1–2, the lower often large, petioled, resembling the innermost basal but with still longer teeth, the upper, when two are present, small and sessile; all *sparingly pilose* on both surfaces or glabrescent above with ciliate margins and villous petioles. Inflorescence paniculate-corymbose, sometimes with long lower branches, 3–15(–40, cult.)-headed, with rather short, often incurved peduncles, which are floccose with numerous black (sometimes long) glandular hairs. *Heads of medium size*, rounded below. *Phyllaries incumbent* in bud ap. W. R. Linton, *dark green* with paler margins, linear-lanceolate, obtuse or subacute, sparingly floccose, densely clothed with blackish, long and short glandular hairs, *epilose*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits sharply dentate. Achenes blackish, about 3.5 mm. long.

β . *decipiens* var. nov.

H. serratifrons var. *triangulare* Williams, l. c. 145 (1902)?; *H. murorum* var. *subulatidens* Hanb. in Bab. Man. ed. 9, 253 (1904); *H. subulatidens* W. R. Lint. Brit. Hier. 47 (1905), non *H. grandidens* subsp. *subulatidens* Dahlst. Bidrag, ii. 131 (1893).

Exsicc.—W. R. Linton, Black Mt., 1902 (type); Riddelsdell, Taren-yr-Esgob, 1923; both in Hb. Mus. Brit.

Folia radicalia magis oblonga, basi truncata, tenuius minus argute dentata, nonnunquam prope basin duobus dentibus parvis angustis deflexis munita.

Radical leaves more oblong, truncate-based, more finely and less sharply toothed, occasionally with two small, narrow, deflexed teeth at the base.

The plant treated here as var. *decipiens* seems to have been first identified with *H. grandidens* subsp. *subulatidens* Dahlst. in Hanbury's list of British Hieracia published in Journ. Bot. xxxii. 225 (1894), and subsequently appeared as *H. subulatidens* Dahlst. in W. R. Linton's 'British Hieracia' (l. c.), based on Clova and Welsh material. The identification is clearly erroneous, for Dahlstedt's plant, well represented at Kew (H. Sc. i. 64, v. 30, and ix. 45), is widely different, being of slender habit, with small, glaucescent, subulately toothed foliage and greyish, glandular

heads. Linton's Exsicc. 141 (as *H. subulatidens*), a cultivated plant obtained at Clova, is a small form with narrow, cuneate-based foliage that does not match Dahlstedt's plant, and is seemingly quite distinct from the Welsh plants similarly named. Another specimen in Herb. Mus. Brit. (Ley, cult. orig. Black Mt., Brecon, 1905) might possibly, judging from its leaf-cutting, belong to Dahlstedt's subspecies, but it is a much coarser plant than the Scandinavian examples. The Welsh '*H. subulatidens*' is a robust form with bright green foliage, fully as distinct from Dahlstedt's plant as that distributed by Linton from Clova. When W. R. Linton dealt with it as a species, he found it necessary to distinguish as a variety *cuneifrons* Welsh specimens in which the leaf-base differed in being cuneate. As the plant must be separated from *H. subulatidens* (Dahlst.), and as the variety *cuneifrons* seems to show the most distinctive features and has the widest distribution in Wales, it appears best to treat it as the type of a new species, *H. cuneifrons*, and to regard the form first noticed and wrongly named '*H. subulatidens*' as a new variety *decipiens*. Roffey (Journ. Bot. lxiii. 318) remarks that the two forms pass into each other.

H. cuneifrons is well characterized by its robust habit, large, coarsely toothed leaves, and glandular, epilose heads recalling those of *H. exotericum*, to which it is closely allied.

Distribution.—35. Monmouth : Llandogo (Shoolbred). 41. Glamorgan : Bridgend (Riddelsdell). 42. Brecon : Craig Cille, Black Mt., Taren-yr-Esgob and Crickhowell (Ley).

var. *decipiens*.

42. Brecon : Black Mt. and Taren-yr-Esgob (Ley).

101. *HIERACIUM PULCHERRIMUM* (F. J. Hanbury) Roffey in Lond. Cat. ed. II (1925).

H. murorum var. *pulcherrimum* Hanb. in Journ. Bot. xxx. 259 (1892), and in Bab. Man. ed. 9, 252 (1904), excl. Yorks. loc. ; *H. pellucidum* var. *pulcherrimum* W. R. Lint. Brit. Hier. 43 (1905) ; *H. murorum* subsp. *pulcherrimum* Zahn l. c. 302 (1921) ?

Exsicc.—Hanbury, Carnedd Dafydd, 1891, in Hb. Hanbury ; Griffiths, Ysgolion Duon, 1893 ; Ley, Carnedd Dafydd, 1904 ; both in Hb. Mus. Brit.

Stem 30–45 cm. high, rather slender, glabrescent or slightly pilose below, with scattered, dark glandular hairs towards the inflorescence. *Radical leaves* spreading, *pale green* ; the primordial small, rotundate, submucronulate, remotely denticulate and truncate-based ; the later *obovate* to oblong, rounded-*obtusely*-mucronulate or the innermost shortly cuspidate, *denticulate with a few ± small, spreading teeth* at the contracted, *± truncate base* ; *stem-leaves* 1–2, the lower spreading or recurved, lanceolate, acute, denticulate, sessile, the upper small, linear-lanceolate ; all *glabrescent* or sparingly (rarely more densely) pilose on both surfaces, with shortly ciliate margins and villous petioles. Inflorescence paniculate-corymbose, compact, 8–12(–30, cult.)-headed, with short accladium and slender branches and peduncles, *± flocculose* and densely clad with strong, unequal, blackish glandular hairs. *Heads narrow and rather small*, scarcely rounded below. *Phyllaries* incumbent in bud, *blackish green* (the inner paler), linear-lanceolate, narrow, acute, with dense, unequal, blackish glandular hairs, *epilose and almost efloccose*. Ligules golden-yellow, glabrous-tipped. Styles livid. Margins of receptacle-pits incise-dentate. Achenes reddish-black, about 3.5 mm. long.

As stated under *H. killinense*, the variety *pulcherrimum* of *H. murorum* was founded by Hanbury on two plants, of which one, collected in Yorkshire, subsequently proved to be *H. killinense*. W. R. Linton, in his 'British Hieracia' (l. c.), restricted the varietal name to the Welsh form, which he transferred to *H. pellucidum*, and his description, except for the pilose-tipped ligules (a character of *H. killinense*), is

applicable to this form. It is not clear whether in this case Zahn has based his account on that of Linton ; his description may have been influenced by the *exsiccata* Linton no. 138 (as *H. murorum* var. *pulcherrimum*, from Brecon), which he appears to have seen and which is actually *H. cuneifrons* (Ley). It seems best, however, to retain the specific epithet '*pulcherrimum*', as it is clear that this is intended primarily to represent the Carnedd Dafydd plant.

H. pulcherrimum, as its name implies, is a beautiful plant with handsome foliage and a tall scape bearing a compact panicle of golden heads with velvety-black involucre.

Distribution.—49. Carnarvon : Carnedd Dafydd (Hanbury). Pen-y-Gwryd !

Endemic.

102. *HIERACIUM ITUNENSE* Pugsley in Journ. Bot. lxxix. 193 (1941).

H. cumbriense W. R. Lint. Brit. Hier. 20 (1905), ex parte ; *H. atratum* subsp. *cumbriense* Zahn, l. c. 682 (1921), ex parte ; non *H. cumbriense* Hanb. in Journ. Bot. xxxi. 17 (1893).

Exsicc.—Riddelsdell, Barras, 1903 (type), in Hb. Mus. Brit.

Caulis 40–60(–80, cult.) cm., gracilescens, striatus, *inferne fere glaber*, sursum pilis numerosis deciduis brevibus basi obscuris glandulisque obscuris ± floccosus. *Folia radicalia* numerosa, *luteo-viridia*, plurima ovata ad elliptica vel elliptico-lanceolata, acuta ad acuminata cuspidatave, remote denticulata ad sinuata-serrata vel dentibus longis patulis argute dentata, *basi subtruncata* vel breviter cuneata (saepe asymmetrice) petiolis longis gracilibus ; *caulinum vulgo unicum*, anguste lineare, bracteaeforme ; omnia *utrinque pilis sparsis vestita* vel superne glabrescentia, marginibus breviter ciliatis petiolisque ± villosis ; folium caulinum glandulis obscuris (ut caulis) saepe parce ciliatum. Anthela ramis suberectis acladium superantibus paniculato-corymbosa, 6–12(–multa, cult.)-cephala, pedunculis flocculosis glandulis obscuris validis densis obsitis. *Involucrea satis parva angustaque*, inferne rotundata. *Squamae* in gemmis, ut videtur, porrectae, *atro-virides*, angustae, lineari-lanceolatae, intimis exceptis obtusae, leviter senescentes, glandulis nigris validis imparibus densis *cum pilis* obscuris longioribus *solitariis* vestitae, *fere effloccosae*. Ligulae aureae, glabrae vel apice levissime pilosae. *Styli fuscii*.

Stem 40–60(–80, cult.) cm. high, rather slender, striate, *nearly glabrous below*, becoming ± floccose upwards, with numerous deciduous, short, dark-based pilose and some dark glandular hairs. *Radical leaves* numerous, *yellowish green* ; the primordial oblong, obtuse-mucronate, denticulate to obscurely sinuate-dentate, abruptly contracted below ; the later *ovate to elliptic* or elliptic-lanceolate, acute to acuminate or cuspidate, distantly *denticulate to sinuate-serrate* or sharply dentate with long, spreading teeth, *subtruncate* or shortly cuneate *below* (often asymmetrically) with rather long and slender petioles ; stem-leaf usually 1, narrow-linear, bractlike ; all *with scattered pilose hairs on both surfaces* or glabrescent above, with shortly ciliate margins and ± villous petioles ; the bractlike stem-leaf often with some dark glandular hairs like the stem. Inflorescence paniculate-corymbose, with suberect branches exceeding the acladium, 6–12(–many, cult.)-headed, the peduncles flocculose with dense, strong, dark glandular hairs. *Heads rather small and narrow*, rounded below. *Phyllaries* porrect in bud ap. W. R. Linton, *blackish-green*, narrow, linear-lanceolate, obtuse except the innermost, slightly senescent, with dense, dark, strong, unequal glandular and a *very few solitary*, longer, dusky *pilose hairs*, *almost effloccose*. Ligules golden-yellow, glabrous- or very sparingly pilose-tipped. *Styles fuscous*. Margins of receptacle-pits unknown. Achenes blackish, 3–3.25 mm. long.

This plant was collected in 1903 by Rev. H. J. Riddelsdell at Barras, in Westmorland, and was identified by W. R. Linton with *H. cumbriense* Hanb. Further

specimens were subsequently obtained in the same station by T. J. Foggitt, by whom the form was cultivated for several years. On comparing these exsiccatae with the original specimens of *H. cumbriense* in Herb. Hanbury, it may be seen that the two plants are distinct although there is much resemblance in their foliage. The inflorescence of *H. itunense* is paniculate, as in the *Vulgata*, and not racemose like the *Subalpina*, and in cultivation it often becomes very polycephalous. The heads, like the peduncles, are very strongly glandular and almost pilose, while in *H. cumbriense* they are more finely glandular with the pilose hairs fairly numerous. The Barras plant shows considerable resemblance to *H. cuneifrons*, *H. pulcherrimum*, and some varieties of *H. exotericum*, as well as to strong forms of *H. killinense*. It is therefore treated as a separate species and placed in Section *Vulgata*, Subsection *Glandulosa*. The name *itunense* is adopted from the classical name of the river Eden (Ituna), in the valley of which the plant grows.

Distribution.—69. Westmorland : Barras (Riddelsdell).

Endemic.

Series **Ciliatiflora**. (See page 135.)

103. *HIERACIUM POLLINARIUM* F. J. Hanbury in Journ. Bot. xxvi. 206 (1888) ; in Bab. Man. ed. 9, 252 (1904) ; Williams, l. c. 142 (1902) ; W. R. Lint. Brit. Hier. 48 (1905) ; *H. murorum* subsp. *pollinarium* Zahn, l. c. 292 (1921).

Exsicc.—Linton no. 89 ; Linton, Bettyhill, 1888 ; both in Hb. Mus. Brit.

Stem 30–50 cm. high, *robust*, nearly glabrous below, becoming \pm floccose with fine, short, dark glandular hairs above. *Radical leaves* thick, *very glaucous* ; the primordial obovate, very obtuse or subtruncate, subdenticulate, shortly attenuate below ; the later large, *oblong-obovate* or the innermost broadly lanceolate, *rounded-obtuse* or subtruncate-mucronulate to subacute, distantly *denticulate* or sometimes finely dentate below, *abruptly contracted to \pm long petioles* ; stem-leaf usually 1, lanceolate, acuminate, denticulate, subsessile ; all *glabrescent above* and sparingly pilose beneath (chiefly along the midrib) and on the margins, petioles \pm villous. Inflorescence furcate-subcorymbose, 2–10-headed, with rather short, suberect *peduncles* (longer when cultivated), which are *densely floccose* with numerous short, dark glandular hairs. *Heads rather large, subtruncate-based*. *Phyllaries* incumbent in bud ap. W. R. Linton, *blackish green, broad* (less so in cultivation), lanceolate-subulate or the outermost lanceolate, obtuse, *with narrow floccose margins* and \pm numerous, rather *short, dark glandular hairs, pilose*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits incise-dentate ap. W. R. Linton. Achenes small, reddish black, about 3 mm. long.

H. pollinarium, known only from two stations in Sutherland, is one of our most distinct hawkweeds. Its robust habit, with large, glaucous, obovate leaves in combination with rather large, blackish green heads, of which the phyllaries are broad, shortly glandular but pilose, are its salient characteristics.

Distribution.—108. W. Sutherland : Bettyhill to Farr (Hanbury). Bettyhill (Foggitt, 1922). Loch Naver (Hanbury).

Endemic.

104. *HIERACIUM PICTORUM* Linton in Journ. Bot. xxix. 271 (1891) ; Williams, l. c. 130 (1902) ; Hanb. in Bab. Man. ed. 9, 251 (1904) ; W. R. Lint. Brit. Hier. 47 (1905) ; *H. murorum* subsp. *pictorum* Zahn, l. c. 319 (1921).

Exsicc.—Linton no. 88 ; Linton, Unich Water, 1889 ; Marshall nos. 1765, 1808, 3436, 3846 and 3987 ; all in Hb. Mus. Brit.

Stem 30–50 cm. high, often reddish, rather slender, nearly glabrous, becoming floccose with some scattered fine glandular and pilose hairs above. *Radical leaves bright green* (rarely spotted with purple), paler or purpurascens beneath; the primordial oval, obtuse-mucronate, denticulate, with rounded base; the later *oblong to ovate-lanceolate* or lanceolate, \pm acute or the inner acuminate, *denticulate* with shortly cuneate base, or *sharply* and \pm deeply *serrate* towards a *truncate* (often asymmetrical) base, occasionally with some detached teeth on the petiole; stem-leaf 0 or 1, ovate-lanceolate, acuminate, serrate and petioled, or narrower and \pm bractlike; all \pm glabrous above, pilose (at least about the midrib) beneath, shortly ciliate, with \pm villous petioles. *Inflorescence* subracemose-corymbose, *compact*, 2–6(–15)-headed, usually with short peduncles, which are floccose with numerous fine, dark glandular and sometimes some pilose hairs. *Heads of medium size*, rounded below. *Phyllaries subperfect in bud*, *blackish green*, rather short, broadly linear-lanceolate, mostly obtuse (occasionally longer, narrower and attenuate), senescent but generally sparingly floccose, with numerous dark glandular and longer, black-based *pilose hairs* intermixed. Ligules glabrous- or slightly pilose-tipped. *Styles yellow or livescent*. Margins of receptacle-pits incise-dentate. Achenes reddish black, about 3.5 mm. long.

H. pictorum is a characteristic though variable species of the Central Scottish Highlands. It differs considerably from most of the previously described species of this Subsection in its glabrate, often purple-tinted foliage, and its compact, generally few-headed inflorescence with dark, appreciably pilose as well as glandular heads. The heads show some resemblance to those of *H. callistophyllum* and *H. dasythrix* of the *Subalpina*, and occasionally the glandular hairs are very few.

Distribution.—88. Mid Perth: Ben Oss (Groves). Ben Laoigh! Cam Creag! Craig-na-lochan! Meal Garbh! 90. Forfar: Canlochen! Clova! 92. S. Aberdeen: Braemar (Marshall). Little Craigindal (Linton). 96. E. Inverness: Dalwhinnie (Marshall). Cluny Castle (Shoolbred). 97. W. Inverness: Aonach Beg and Fersit Forest (Marshall). 98. Argyll: Kingshouse and Ben Chaisteil (Marshall). Ballachulish (Bucknall). 104. N. Ebudes: Broadford, Skye (Macvicar). Raasay (Cooke). 106. E. Ross: Altguish (Marshall). Rogie Falls (Shoolbred).

Endemic.

105. *HIERACIUM POLLINARIOIDES* Pugsley in Journ. Bot. lxxix. 193 (1941).

H. candelabrae W. R. Lint. Brit. Hier. 43 (1905) quoad loc. scot. *H. murorum* var. *crassiusculum* Alm. in Lond. Cat. ed. 9 (1895) (nomen?).

Exsicc.—Hanbury, Lochinver, 1890, (type) in Hb. Hanbury: Hanbury, Smoo Cave, 1885; in Hb. Mus. Brit.

Caulis 20–50 cm., glabrescens, basin versus pilis paucis pallidis vestitus, sursum pilis tenuibus basi obscuris sparsis glandulisque solitariis floccosus. *Folia radicalia* pauca, *glaucescentia* subtus pallidiora, plurima *late ovalia* ad elliptica, *rotundato-obtusumucronulata*, vel intima acuta, *subintegra* vel dentibus paucis vix altis prope basin *rotundatam* subtruncatamve tenuiter denticulata; caulinum 0–1, late lanceolatum ad lineare, acuminatum, \pm denticulatum, petiolatum; omnia *glabrescentia* vel utrinque leviter pilosa, marginibus petiolisque brevibus pilosis. Anthela paniculato-corymbosa, ramo longo inferiore interdum praedita, 3–15-cephala, *pedunculis* breviusculis *dense floccosis* et glandulis obscuris subaequis densis hirsutis. *Involucra mediocria*, *satis lata*, *basi rotundata*. *Squamae* in gemmis incumbentes, *obscure olivaceae*, lineari-lanceolatae, \pm acutae, basi marginibusque \pm floccosae, senescentes, glandulis obscuris densis *pilisque multis* basi atris longioribus *vestitae*. Ligulae apice glabrae. *Styli lutei*. Alveoli receptaculi margine argute dentati.

Stem 25–50 cm. high, glabrescent, with a few pale pilose hairs below, becoming floccose upwards, with scattered fine, dark-based pilose and occasional glandular

hairs. *Radical leaves* few, *glaucous*, paler beneath; the primordial small, oval-rotundate, rounded-obtuse-mucronulate, remotely denticulate and subtruncate-based; the later *broadly oval* to elliptic, *rounded-obtuse-mucronulate* or the innermost *acute*, *subentire* or finely denticulate with a few, generally shallow teeth about the *rounded* or subtruncate base, petioles short; stem-leaf 0-1, broadly lanceolate to linear, acuminate, \pm denticulate and petiolate; all *glabrescent* or slightly pilose on both surfaces, with \pm pilose margins and petioles. Inflorescence paniculate-corymbose, sometimes with a long lower branch, 3-15-headed, the rather short *peduncles thickly floccose*, with dense dark, subequal glandular hairs. *Heads of medium size*, rather broad, rounded below. *Phyllaries* incumbent in bud, *dark olive green*, linear-lanceolate, \pm acute, \pm floccose below and on the margins, senescent, with dense dark glandular and many longer, dark-based *pilose hairs*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits sharply dentate. Achenes blackish, 3-3.5 mm. long.

The Lochinver specimen of this plant was named '*crassiusculum*' by Elfstrand, and *H. murorum* var. *crassiusculum* Ahnq. was accordingly inserted in the ninth edition of the London Catalogue. This appears to be a varietal *nomen nudum*. W. R. Linton (l. c.) identified this plant with others which he described as *H. candelabrum*, and cited the locality Lochinver, as well as Smoo Cave, also in Sutherland, where the same form occurs. These Scottish plants, however, are widely different from the Yorkshire form, on which Linton's description is evidently based. Their leaves are much less cut and lack the retrorse basal teeth, and their heads are entirely different, shorter and broader with pilose as well as glandular hairs and yellow styles. In view of these points of distinction and as the Lochinver specimens seem adequate, the plant is described as a new species, *H. pollinarioides*. Hanbury remarks of it 'approaching *pollinarium* in some respects', which is true of the plant's general appearance and of its densely floccose peduncles. What appears to be the same plant was collected by Marshall at Skerry, v. c. 108 (No. 2327) and referred to *H. serratifrons* var. *caliginosum* Dahlst. A plant collected by Backhouse at Walsingham, in Durham, is possibly conspecific.

Distribution.—108. W. Sutherland: Lochinver and Smoo Cave, (Hanbury). Skerry (Marshall).

Endemic.

106. *HIERACIUM CALIGINOSUM* (Dahlstedt) Roffey in Lond. Cat. ed. 11 (1925).

H. serratifrons subsp. *caliginosum* Dahlst. Bidrag, ii. 103 (1893); *H. serratifrons* var. *caliginosum* Williams, l. c. 146 (1902); W. R. Lint. Brit. Hier. 46 (1905); *H. murorum* subsp. *caliginosum* Zahn, l. c. 303 (1921).

Exsicc.—Dahlst. H. Sc. i. 47 and 48; xi. 19; xxiv. 63; all in Hb. Kew; Marshall no. 3986, in Hb. Mus. Brit.; Dahlst. H. Exs. i. 63, in Hb. Hanbury.

Stem 30-50 cm. high, sparingly pilose below, floccose with occasional fine glandular hairs above. *Radical leaves green*; the primordial small, rotundate or rotund-oval, rounded-obtuse, slightly denticulate and rounded below to winged petioles; the later *oval* to *obovate-lanceolate*, obtuse-mucronate to shortly acuminate, *denticulate* or the inner with short, spreading, denticulate teeth, especially towards the base, *abruptly narrowed below* or the inner attenuate to \pm long petioles; stem-leaf 0 or 1, linear; all (except the primordial) *glabrescent above*, pilose, chiefly on the midrib, beneath, with ciliate margins and long-pilose petioles. Inflorescence furcate-corymbose, 3-10-headed, the peduncles floccose with many dark glandular hairs. *Heads of medium size*, rounded below, with some bracteoles close to the outer phyllaries. *Phyllaries* porrect in bud ap. W. R. Linton, *greyish green*, the inner with paler margins, linear-oblong, obtuse, rather densely floccose, with many dark glandular and a few short pilose hairs. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits unknown. Achenes unknown.

This plant is recorded as found by Hanbury in 1888 by the river Almond, in Perthshire, and W. R. Linton (l. c.) gives stations also for Sutherland and Yorkshire. The only British specimens examined that seem sufficiently to warrant identification with Dahlstedt's plant belong to the *Inchnadamph* form collected by Marshall and cited above.

H. caliginosum is characterized by long stalked, slightly toothed leaves, more or less abruptly narrowed below, and rounded, greyish-green heads that are rather densely floccose and almost entirely glandular. It differs from *H. pictorum* by its more narrowly based foliage, and its much paler and less pilose heads.

Distribution.—108. W. Sutherland : Inchnadamph (Marshall).

General Distribution.—Sweden.

107. *HIERACIUM SUBPRASINIFOLIUM* Pugsley in Journ. Bot. lxxix. 193 (1941).

Essicc.—Linton, Great Rocks Dale (type), and Chee Dale, 1903 ; both in Hb. Mus. Brit. as *H. caliginosum*.

Caulis 30–60 cm., ±robustus, basi purpurascens et glabrescens, sursum floccosus ±dense glandulosus. *Folia radicalia* crassa, subcoriacea, *alte prasino-viridia subtus glauca*, plurima satis magna, *ovato-lanceolata*, acuta ad *acuminata*, *denticulata* vel *basin inaequaliter* (saep̄ late) *truncatam* versus dentibus ±patentibus irregulariter dentata ; caulinum 0–1, lanceolatum ad ovato-lanceolatum, acuminatum, ±argute dentatum, petiolatum : omnia *superne glabrescentia vel leviter pilosa*, subtus pilis sparsis hirsuta, marginibus ciliatis petiolisque longis gracilibus rubicundis breviter pilosis. Anthela paniculato-corymbosa, compacta, rarius ramo longo inferiore praedita, 4–10-cephala, ramulis brevibus pedunculisque dense floccosis et glandulis atris validis dense vestitis. *Involucra mediocria*, inferne rotundata. *Squamae* in gemmis incumbentes, *obscurae virides*, lineari-oblongae, plurimae obtusae, ±floccosae senescentesque, glandulis atris *densis pilisque obscuris longioribus obsitae*. Ligulae apice glabrae. Styli leviter lividi. Alveoli receptaculi margine breviter dentati.

Stem 30–60 cm. high, ±robust, purplish about the base, glabrescent below, becoming floccose with ±dense glandular hairs above. *Radical leaves* thick, subcoriaceous, *deep bluish green above and glaucous beneath* ; the primordial broadly oval, obtuse-mucronate, denticulate, rounded or subtruncate below ; the later large, *ovate-lanceolate*, acute to acuminate, *denticulate* or irregularly dentate, *with ±spreading teeth towards the unequally* (and often broadly) *truncate base* ; stem-leaf 0 or 1, lanceolate to ovate-lanceolate, acuminate, ±sharply dentate, petioled ; all *glabrescent or slightly pilose above*, with scattered pilose hairs beneath, margins ciliate and the long, slender, reddish petioles shortly pilose. Inflorescence paniculate-corymbose, compact or occasionally with a long, lower branch, 4–10-headed, the short branches and peduncles densely floccose and densely clothed with strong, black glandular hairs. *Heads of medium size*, rounded based. *Phyllaries* incumbent in bud, *dark green*, linear-oblong, mostly obtuse, ±floccose and senescent, with dense black glandular and longer, *dark pilose hairs* intermixed. Ligules glabrous-tipped. Styles light livid. Margins of receptacle-pits shortly dentate. Achenes blackish, about 3 mm. long.

This hawkweed is described from excellent material in Herb. Linton (now in Herb. Mus. Brit.) collected in the Derbyshire dales and labelled '*H. caliginosum* Dahlst.'. It shows but little resemblance to *H. caliginosum* and seems more nearly allied to the Yorkshire *H. Pseudo-Stenstroemii*, which has similarly glaucous foliage and paniculate, densely glandular inflorescence. It differs, however, from the latter species by its broad-based and less toothed foliage, and its rather smaller heads with shorter and less attenuate phyllaries and glabrous-tipped ligules.

Distribution.—57. Derby : Great Rocks Dale and Chee Dale (Linton).

Endemic.

108. *HIERACIUM PSEUDO-STENSTROEMII* Pugsley in Journ. Bot. lxxix. 194 (1941).

H. silvaticum var. *Stenstroemii* Williams, l. c. 134 (1902); *H. serratifrons* var. *Stenstroemii* W. R. Lint. Brit. Hier. 45 (1905); non *H. murorum* subsp. *Stenstroemii* Zahn, l. c. 292 (1921); nec *H. serratifrons* subsp. *Stenstroemii* Dahlst. Bidrag, ii. 86 (1893).

Exsicc.—Cotton, Upper Wharfedale, 1891 (type), in Hb. Hanbury; Linton no. 173 (Cam Glen); Ley, Twistleton Scaurs, 1902, and Upper Wharfe, 1904; all in Hb. Mus. Brit.; Pugsley, Heseldon Glen, in Hb. Pugsley.

Stem 30–50 cm. high, rather robust, reddish about the base, glabrescent below, slightly floccose with scattered fine glandular and black-based pilose hairs above. *Radical leaves* rather thick, *dull caesious green*: the primordial oval, rounded-obtusely-mucronulate, denticulate or slightly sinuate-dentate, subtruncate-based; the later usually large with long petioles, *oblong to long-lanceolate*, obtuse-mucronate to acute or acuminate, abruptly narrowed to a *subtruncate or sagittate base*, the outer denticulate to *sinuate-dentate*, the inner sharply and irregularly serrate-dentate (chiefly below) with teeth occasionally decurrent on the petiole; stem-leaf 0 or 1, linear-lanceolate to lanceolate, acuminate, sharply toothed, petiolate; all *shortly pilose or glabrescent above*, pilose and \pm floccose beneath, with ciliate margins and villous petioles. Inflorescence paniculate- or (in weak plants) furcate-corymbose, 3–10-headed, the peduncles \pm floccose with numerous dark glandular and fewer pilose hairs. *Heads of medium size*, rounded below. *Phyllaries* porrect in bud ap. W. R. Linton, *dark-green*, lanceolate-subulate, *attenuate* and mostly acute, floccose, especially on the margins, with dense dark glandular and \pm numerous longer pilose hairs. *Ligules shortly pilose-tipped*. Styles livid. Margins of receptacle-pits sharply dentate. Achenes blackish, 3.5–3.75 mm. long.

It is not easy to understand how this plant came to be identified with the widely different Scandinavian *H. Stenstroemii* Dahlst. There is good material of Dahlstedt's plant at Kew (H. Sc. i. 33, i. 34, i. 35 and ix. 43), all evidently conspecific, which shows it to be an ally of *H. pellucidum* Laest., with characteristic large, thin, oval, light green and faintly toothed foliage, and heads of moderate size with clothing entirely glandular.

The present plant has oblong, thick, caesious, sinuate-dentate foliage, and heads clad with numerous pilose as well as glandular hairs. Some examples are not readily separable from *H. subcyaneum*, of the Subsection *Bifida*, although this normally has much larger and less glandular heads. The varying forms of the Section *Vulgata* occurring in Yorkshire still need further investigation.

Distribution.—64. M.W. Yorks: Upper Wharfedale (Cotton). Kettlewell (Linton). Giggleswick (Hanbury). Heseldon Glen! Ribbleshead!

Endemic.

109. *HIERACIUM LONGILOBUM* Dahlstedt ex Marshall in Journ. Bot. xli. 286 (1908); *H. murorum* subsp. *longilobum* Dahlst. H. Exs. ii. 83 (1889), Jämtland ad Storlien (nomen): Zahn, l. c. 297 (1921).

Exsicc.—Linton no. 149 (Midlaw Burn) (as *H. stenophyes* var. *oxyodus*); Linton, Midlaw Burn, Moffat, 1890; Dahlst. H. Exs. ii. 83; all in Hb. Mus. Brit.; Dahlst. H. Sc. v. 85 and 86; xi. 94 and 95; xxiii. 64; all in Hb. Kew.

Stem 30–50 cm. high, strict, slender, glabrescent, sparingly floccose, and with a few scattered, fine, dark glandular hairs above. *Radical leaves* few, *bright green*; the primordial small, oblong, acute, denticulate, shortly narrowed below; the later *lanceolate*, acuminate, with \pm remote, sharp, deep, ascending teeth, *shortly attenuate below*, the teeth occasionally descending along the petioles; *stem-leaves usually two*, the lower large, petiolate, and resembling the inner basal, or rarely linear-lanceolate

and entire, the upper linear-lanceolate, \pm bractlike ; all *nearly glabrous above* and sparsely pilose beneath, and on the margins and petioles. Inflorescence racemose-corymbose, 2-10(-15)-headed, with slender, suberect branches, the peduncles sparingly floccose with \pm numerous fine, dark glandular hairs. *Heads of medium size, elongate*, rounded below. *Phyllaries* (incumbent) in bud, *dark green*, broad, linear-oblong, obtuse, very sparingly floccose, with \pm numerous, long and short, dark glandular and a few pilose hairs. *Ligules shortly pilose-tipped* or puberulous. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 3.5 mm. long.

H. longilobum Dahlst. was first reported as a British species in 1908 by Marshall (l. c.), the record being founded on the plants referred first to *H. stenophyes* var. *oxyodus* W. R. Lint. and subsequently to *H. oxyodus* W. R. Lint., with special reference to the Moffat form. This Moffat form, as exemplified in the exsiccata, Linton no. 149, originally sent out as *H. stenophyes* var. *oxyodus*, was combined with Perthshire specimens by W. R. Linton in 'British Hieracia' to form a new species, *H. oxyodus*, but it has been pointed out under that species that the Perthshire and Moffat plants are not identical, and the name *H. oxyodus* has been restricted to the former. The Moffat form, however, as represented in Linton no. 149, is not homogeneous. Specimens from Midlaw Burn seem to have been correctly identified with Dahlstedt's exsiccatae of *H. longilobum*, which differs essentially from *H. oxyodus* in its bright green foliage and glandular phyllaries. But others, sent out in the same set, were obtained in another locality in the Moffat district (Black's Hope) and belong to *H. stenophyes* W. R. Linton.

Distribution.—72. Dumfries : Moffat (Linton).

General Distribution.—Sweden.

110. *HIERACIUM SEMI-CRASSICEPS* Pugsley in Journ. Bot. lxxix. 194 (1941).

Exsicc.—Linton, Glen Fiagh, Clova, 1894 (type), in Hb. Mus. Brit.

Caulis 20-40 cm., inferne leviter pilosus, sursum pilis obscuris sparsis glandulisque nonnullis floccosis. *Folia radicalia laete viridia*, plurima ovalia ad *oblonga lanceolata*, obtuso-mucronata ad *acuta*, dentibus latis *undulato-serrata* sed intima *basin abrupte angustata vel sagittata versus dentibus horizontalibus \pm laciniata*, dentibus in petiolo nonnunquam descendentibus ; caulinum vulgo unicum, ovato-lanceolatum, acuminatum, argute serratum, prope petiolum brevem \pm laciniatum ; omnia *supra \pm glabrescentia*, subtus pilosa, marginibus molliter ciliatis petiolisque villosis. Anthela racemoso-corymbosa, 2-6-cephala, ramulis suberectis pedunculisque dense floccosis, glandulis obscuris numerosis obsitis. *Involucra mediocria*, basi rotundata. *Squamae atrovirides*, linearilanceolatae, subacutae, floccosae (dense in marginibus), valde senescentes, glandulis obscuris imparibus satis densis *pilisque multis longis obscuris vestitae*. *Ligulae apice pilosae*. *Styli lutei*.

Stem 20-40 cm. high, slightly pilose below, becoming floccose upwards with some scattered dark pilose and glandular hairs. *Radical leaves bright green* ; the primordial oval, subrotund-obtuse-mucronulate, \pm serrate, abruptly contracted below ; the later oval to *oblong or lanceolate*, obtuse-mucronate to acute, *undulate-serrate* with broad teeth, the inner \pm *lacinate with horizontal teeth at the abruptly narrowed or sagittate base*, the teeth sometimes decurrent on the petiole ; stem-leaf usually 1, ovate-lanceolate, acuminate, sharply serrate, becoming \pm *lacinate* towards the short petiole ; all \pm *glabrescent above* and pilose beneath, with softly ciliate margins and villous petioles. Inflorescence racemose-corymbose, 2-6-headed, with suberect branches, the peduncles densely floccose with numerous dark glandular hairs. *Heads of medium size*, rounded below. *Phyllaries* in bud, *blackish green*, linear-lanceolate, subacute, floccose (densely on the margins), strongly senescent, with

rather dense, unequal, dark glandular and *many long, dark pilose hairs*. *Ligules pilose-tipped*. *Styles yellow*. Margins of receptacle-pits unknown. Achenes blackish, nearly 4 mm. long.

Specimens of this plant were sent in 1897 to Dahlstedt, who reported 'Is to be well distinguished from *H. ciliatum* Almq. but resembles this f. in regard to the leaves, and *H. crassiceps* m. in regard to the heads'. *H. semi-crassiceps* clearly recalls *H. crassiceps* (Dahlst.) in the form and clothing of its heads, but it is not so easy to see a likeness to *H. ciliatum* in its deeply cut foliage. Its distinctly pilose-tipped ligules, however, are similar to those of *H. ciliatum*.

Distribution.—90. Forfar : Clova (Linton).

Endemic.

111. *HIERACIUM CILIATIFLORUM* Pugsley in Journ. Bot. lxxix. 194 (1941).

H. ciliatum Almq. in Thedenius, Fl. Upland, 360 (1871) ; Williams, l. c. 140 (1902) ; W. R. Lint. Brit. Hier. 44 (1905) ; *H. murorum* var. *ciliatum* Hanb. in Bab. Man. ed. 9, 253 (1904) ; *H. praecox* subsp. *ciliatum* Zahn, l. c. 239 (1921) ; non *H. ciliatum* Willd. Sp. Pl. iii. 1585 (1800).

Easicc.—Lindbg. H. Sc. iii. 122, in Hb. Kew and Hb. Mus. Brit. : Dahlst. H. Sc. i. 58–60 ; xxiii. 41 ; in Hb. Kew ; Linton no. 171 (Wharfedale) ; Linton, Strome, 1888 ; Marshall no. 3299 ; all in Hb. Mus. Brit.

Stem 30–50 (–60) cm. high, generally robust, \pm pilose below and sparingly floccose and glandular above. *Radical leaves* few, *pale or yellowish green* ; the primordial small, subrotund-oval, rounded-obtuse-mucronate, subentire, and subtruncate below ; the later large, *oval* or lanceolate-oval, *obtuse-mucronate* or the inner acute, *glandular-denticulate* and \pm *sinate-dentate* below, sometimes with the basal teeth rather longer and horizontal or slightly retrorse, *shortly cuneate-based* or abruptly contracted into long petioles, *sometimes subcordate* ; stem-leaf usually 1, ovate-lanceolate, acuminate, with a few sharp teeth, petioled, or more rarely small, narrower and sessile ; all *with scattered pilose* (\pm subsetiform) *hairs* on both surfaces, the margins ciliate and the petioles long-pilose. Inflorescence furcate-corymbose, 3–6 (–many)-headed, sometimes with a long lower branch, the accladium and peduncles (sometimes incurved) of medium length, floccose with many dark glandular and some pilose hairs. *Heads rather large*, rounded below. *Phyllaries* porrect in bud ap. W. R. Linton, *dark green* with paler margins, linear-oblong, obtuse or the inner acute, floccose and senescent, with many dark glandular and *few or more rarely numerous pilose hairs*. *Ligules strongly pilose-tipped*. *Styles* yellow or \pm livid. *Margins of receptacle-pits dentate-fimbriate*. Achenes blackish, about 3.5 mm. long.

The foliage of *H. ciliatiflorum* recalls the Section *Sub-Oreadea* owing to the more or less subsetiform character of the hairs on the upper leaf-surface. The inflorescence, however, and especially the heads, are of the '*Murorum*' type, and the plant seems, on the whole, most nearly allied to *H. varicolor* Dahlst. of our British species. The dentate-fimbriate receptacle-pits are anomalous in this group.

The name *H. ciliatiflorum* is substituted for *H. ciliatum* Almq., which is a later homonym.

Distribution.—64. M.W. Yorks : Settle ! 88. Mid Perth : By Almond, Logie House (Hanbury). 105. W. Ross : Strome (Linton). 108. W. Sutherland : Ben Loyal and Inchnadamph (Marshall).

General Distribution.—Sweden, Denmark.

112. *HIERACIUM VARIICOLOR* Dahlstedt ex Stenström, Värml. Archier. 22 (1889) ; W. R. Lint. Brit. Hier. 44 (1905) ; *H. integratum* subsp. *variicolor* Dahlst. Bidrag, ii. 114 (1893) ; *H. integratum* Williams, l. c. 138 (1902) ; *H. murorum* subsp. *variicolor* Zahn, l. c. 321 (1921).

Erssicc.—Dahlst. H. Sc. i. 56, 57 ; ii. 68 ; v. 36 ; all in Hb. Kew ; Dahlst. H. Exs. i. 53 ; Marshall no. 3844 (Keltney Burn) ; both in Hb. Mus. Brit.

Stem 30–50 cm. high, rather slender, nearly glabrous below or slightly pilose about the base, becoming floccose with scattered fine pilose and glandular hairs above. *Radical leaves* few, *bright green*, \pm *spotted* with purplish brown ; the primordial small, subrotund-ovate, rounded-obtuse-mucronate, subentire, rounded or subcordate below ; the later *oval to oblong*, *obtuse-mucronate* or the inner subacute, *denticulate* or slightly undulate-dentate (occasionally more sharply dentate) towards the *rounded base* ; stem-leaf 0 or 1, ovate-lanceolate, acuminate, \pm *sharply toothed*, petioled, or smaller and bractlike ; all \pm *pilose on both surfaces*, with ciliate margins and villous petioles, the cauline leaf also \pm *floccose* beneath. Inflorescence racemose-corymbose, 2–6(–20, cult.)-headed, with \pm *arcuate* peduncles, which are densely floccose with numerous dark glandular hairs. *Heads rather small and thick*, rounded- or subtruncate-based. *Phyllaries* porrect in bud ap. W. R. Linton, *dark green*, *variegated* with pale, densely floccose margins, linear-oblong, mostly obtuse, senescent as well as floccose, with many dark glandular hairs, *epilose*. *Ligules* \pm *pilose-tipped*. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

β . *piligerum* var. nov.

Erssicc.—Linton no. 18 (Cairnwell) (type) ; Marshall nos. 3850 and 3851 ; Linton, Union Water and Glen Dole, 1890 ; Salmon, Fortingal, 1913 ; all in Hb. Mus. Brit.

Planta saepe quam typus robustior. Folia radicalia basi irregulariter truncata vel subcordata. Pedunculi saepe pilis paucis insuper glandulis praediti. Involucra mediocria vel raro majuscula ; squamae pilis \pm numerosis inter glandulas saepe quam in typo validiores immixtis obsitae.

Often of more robust habit than the typical form. Radical leaves with irregularly truncate or subcordate base. Peduncles often with a few pilose as well as glandular hairs. Heads of moderate size or occasionally rather large. Phyllaries with \pm numerous pilose intermixed with the (often relatively stronger) glandular hairs.

H. variicolor is generally a distinct plant, readily to be recognized by its subentire, lightly spotted, oval foliage, and its dark heads with conspicuous, pale, floccose margins to the phyllaries. The Scandinavian specimens at Kew and the British Museum agree with the descriptions of Dahlstedt and Zahn, and their peduncles and phyllaries are entirely epilose. The Scottish plants, which seem otherwise identical, almost invariably produce a mixture of glandular and pilose hairs on the phyllaries and frequently on the peduncles ; and their heads are usually larger than in the type. Such plants are therefore treated as a separate variety *piligerum*.

The specimens from Clova and other Scottish localities collected by Marshall and others, and referred to *H. orbicans* Almq. (*H. rotundatum* auct. angl.) differ from Almqvist's plant in having spotted foliage and heads predominantly glandular. They appear inseparable from the variety *piligerum* of *H. variicolor*.

Ley's Ingleborough specimen of *H. variicolor* in Herb. Mus. Brit. has the phyllaries villous with long pilose hairs and does not seem to belong here.

Distribution.—88. Mid Perth : Craig-na-lochan ! Keltney Burn (Marshall).
var. *piligerum*.

64. M.W. Yorks : Chapel-le-Dale (Ley). 88. Mid Perth : Glen Lyon and Craig Cailleach (Linton). Craig-na-lochan ! 89. E. Perth : Glen Shee (Marshall). Cairnwell (Linton). 90. Forfar : Clova ! Canlochen ! 92. S. Aberdeen : Lochnagar (Backhouse). Braemar ! 97. W. Inverness : Glen Spean (Marshall). 98. Argyll : Dalmally (Marshall). 106. E. Ross : Wyvis Forest (Marshall). 108. W. Sutherland : Inchnadamph (Marshall).

General Distribution (of the species).—Sweden, Norway.

113. *HIERACIUM DIPTEROIDES* Dahlstedt ap. Sinclair in B. E. C. Report, x. pt. iii. 474-5 (1934).

Exsicc.—Sinclair no. 908 (Urlar Burn, Aberfeldy).

Stem 30-40 cm. high, rather slender, pilose below, floccose with scattered pilose hairs and an occasional glandular hair above. *Radical leaves green*; the primordial oval, obtuse-mucronate, finely denticulate and abruptly narrowed below; the later *oval to lanceolate, obtuse-mucronate to acute, subentire* with a few distant denticulations or \pm fine teeth towards the *cuneate base*; stem-leaf 0 or 1, long-lanceolate, acute, subentire, subsessile; all clothed on both surfaces and the margins *with soft pilose hairs*, petioles villous. Inflorescence paniculate-corymbose, 2-5(-20)-headed, with branches exceeding the accladium, the peduncles densely floccose with many dark glandular and some pilose hairs. *Heads of medium size, rounded-based. Phyllaries olive-green, lanceolate-subulate, obtuse or the inner acute, floccose (chiefly on the margins and towards the base), slightly senescent, with dense dark, unequal glandular hairs and a few long pilose hairs intermixed. Ligules slightly pilose-tipped. Styles fuscous. Margins of receptacle-pits unknown. Achenes blackish, 3-3.25 mm. long.*

This plant is stated by Dahlstedt to be nearly related to his *H. dipterum*, from Middle Sweden, and to be allied to his *H. torticeps*. It clearly belongs to the Section *Vulgata*, Subsection *Glandulosa*, and seems from its rather narrow, subentire foliage, fairly large, rounded-based heads and ciliate ligules to be best placed among the *Ciliatiflora*. It has been seen only from a single locality.

Distribution.—88. Mid Perth: Aberfeldy (Sinclair).

Endemic.

Subsection SAGITTATA subsect. nov.

H. Vulgata—*Subvulgata* W. R. Lint. Brit. Hier. 4, ex parte (1905), pro maj. parte; Subsect. *Eu-Vulgata* sp. *H. sagittatum* sp. coll. Zahn, l. c. 342 (1921), pro maj. parte.

Plantae scapigeræ foliis \pm hirsutis et involucris subdense pilosis \pm glandulosis præditæ.

Scapigerous or subscapigerous plants with \pm hirsute stem and foliage; stem-leaves 0-2, the lower (when more than one are present) normally well-developed and petiolate. Radical leaves generally green, with \pm truncate, sagittate or shortly contracted base. Inflorescence \pm paniculate-corymbose. Heads rather small to rather large, rounded below except in *H. subhirtum*, *H. rivale* and *H. crebridentiforme*. Phyllaries incumbent in bud, except in *H. rivale* and *H. crebridentiforme*, with numerous pilose and fewer (generally fine) glandular hairs, the latter wanting in *H. breadalbanense* and sometimes in *H. euprepes*, and more numerous in *H. rivale*. Ligules glabrous- or shortly pilose-tipped. Styles yellow to livid. Margins of receptacle-pits dentate or more rarely dentate-fimbriate.

The *Sagittata* are green-leaved plants, excepting *H. clivicolum*, resembling the *Glandulosa* but with (on an average) rather larger and broader heads, which are much less conspicuously glandular. A curious feature of *H. euprepes* and its two allies is their dentate-fimbriate receptacular alveoles, usually a character of the *Cerinthoidea* and rare in the Section *Vulgata*.

The species of this Subsection are all uncommon or local plants in Britain. Eight occur in Scotland, whereof five are not known elsewhere. Northern England possesses five (two endemic), Wales three (one endemic) and Ireland one only. The group is wanting in Southern England. *H. euprepes* has the widest distribution,

being found in Wales and Ireland, and extending to the extreme north of Scotland. On the European Continent the *Sagittata* inhabit Scandinavia and northern Europe, but seem to be absent from the centre and the south.

Series *Eu-Sagittata* [Grege *H. oïstophyllum* Pugsley].

Leaves subtruncate or sagittate, or at least abruptly narrowed below. Margins of receptacle-pits \pm dentate.

* Heads of medium size or rather small.

- Leaves oval, little toothed, \pm sagittate-based. Heads rather small. Phyllaries obtuse, normally with fine glandular hairs. Ligules shortly pilose-tipped *H. oïstophyllum*.
 Leaves oval, sinuate-dentate, \pm sagittate-based. Heads rather small, scarcely rounded below. Phyllaries subacute, with few fine glandular hairs. Ligules glabrous-tipped *H. pycnodon*.
 Leaves \pm oval, dentate and truncate-based. Heads of medium size to small, narrowed below. Phyllaries nearly eglandular. Ligules sparingly pilose-tipped *H. subhirtum*.
 Leaves oblong, \pm serrate and sagittate-based. Heads of medium size to rather large, narrowed below. Phyllaries with many dark glandular hairs, perfect in bud. Ligules shortly pilose-tipped *H. rivale*.
 Leaves elliptic, \pm serrate, abruptly narrowed below. Heads of medium size, rather broad. Phyllaries almost eglandular. Ligules glabrous-tipped *H. nisticolum*.
 Leaves oval, denticulate, rounded below. Heads of medium size. Phyllaries eglandular. Ligules glabrous-tipped *H. breadalbanense*.

** Heads rather large.

- Leaves oval, \pm sinuate-dentate, abruptly narrowed below. Inflorescence laxly furcate-corymbose. Heads narrowed below. Phyllaries with few short glandular hairs. Ligules \pm pilose-tipped *H. crebriidentiforme*.
 Leaves broadly oval, dark green, \pm sinuate-dentate, rounded below. Inflorescence paniculate-corymbose. Heads rounded below. Phyllaries with short glandular hairs. Ligules glabrous-tipped *H. auratiflorum*.
 Leaves oblong, with spreading teeth, \pm truncate-sagittate below. Heads rounded below. Phyllaries with few short glandular hairs. Ligules \pm pilose-tipped *H. Lintonii*.

Series *Fimbriata* [Grege *H. euprepes* Hanb.].

Leaves shortly narrowed below with shallow teeth. Ligules glabrous-tipped. Margins of receptacle-pits dentate-fimbriate.

- Leaves \pm elliptic. Accladium and adjacent peduncle very short, geminate. Heads of medium size, subcylindric. Phyllaries few and broad, with few glandular hairs *H. euprepes*.
 Leaves \pm oblong. Accladium and adjacent peduncle very short, geminate. Heads rather small. Phyllaries few and broad, with few fine glandular hairs *H. orcadense*.
 Leaves ovate-lanceolate. Inflorescence compactly paniculate. Heads of medium size or rather large. Phyllaries rather broad, with few fine glandular hairs *H. clivicolum*.

Series **Eu-Sagittata**. (See above.)

114. *HIERACIUM OISTOPHYLLUM* Pugsley in Journ. Bot. lxxix. 194 (1941).

H. sagittatum Lindbg. ex Stenstr. Värml. Arch. 11 (1889); Dahlst. Bidrag, ii. 179 and 192 (1893); Williams, l. c. 138 (1902); *H. sagittatum* with var. *philanthrax* W. R. Lint. Brit. Hier. 52 (1905); *H. murorum* var. *sagittatum* Hanb. in Journ. Bot. xxx. 131 (1892); in Bab. Man. ed. 9, 253 (1904); *H. sagittatum* subsp. *sagittatum* Zahn, l. c. 343 (1921); non *H. sagittatum* Hoffm. and Link, Fl. Portug. ii. 146 (1809).
Exsicc.—Lindbg. H. Sc. ii. 58; Dahlst. H. Exs. iii. 42; Linton no. 175 (as var. *philanthrax*); Marshall nos. 3012 and 3147 (as var. *philanthrax*); Ley, Upper Wharfedale, 1904, as *H. philanthrax*; all in Hb. Mus. Brit.

Stem 30–50 cm. high, normally slender, pilose (especially below) and floccose, becoming in the upper half densely floccose and with \pm numerous, spreading, pale pilose hairs. *Radical leaves* (often few) green and paler beneath, sometimes slightly purple-spotted; the primordial small, subrotund-ovate, rounded-obtuse-mucronulate, subentire, with subcordate or truncate base; the later *oval or ovate-lanceolate*, obtuse-mucronate or the inner acute, distantly *denticulate* (more rarely finely toothed) *with a few shallow but sharp teeth below*, the basal pair horizontal and *forming a truncate-sagittate base*; stem-leaf usually 1, relatively large, ovate-lanceolate, acuminate, denticulate, petioled, often with a sagittate base; all normally shortly pilose on both surfaces with subsetiform hairs, with shortly ciliate margins and villous petioles, the cauline also \pm floccose beneath. Inflorescence paniculate-corymbose, 3–12(–20)-headed, with short accladium and spreading, incurved peduncles, which are densely floccose, with numerous pale, spreading pilose and some fine glandular hairs. *Heads of medium size or rather small*, rounded below. *Phyllaries* incumbent in bud, *olive-green*, rather broad, linear-oblong, *obtuse*, floccose (especially on the margins), *with numerous dark-based pilose and fewer fine, short glandular hairs*. *Ligules shortly pilose-tipped*. *Styles fuscous*. Margins of receptacle-pits shortly elevated, obscurely dentate. Achenes reddish-black, about 3.5 mm. long.

β. abrasum (Dahlst.) comb. nov.

H. sagittatum subsp. *sagittatum* var. *abrasum* Dahlst. in Johnston, 'Additions to the Flora of Orkney', xii. 6, 7, in Trans. Bot. Soc. Edin. (1929).

Ersicc.—Johnston no. 4007 (Hoy).

Peduncles and phyllaries (few, obtuse) with stronger and blacker glandular hairs and far fewer pilose hairs than in the type, also less floccose. Styles dark fuscous.

The majority of the British examples of this species, including all from Yorkshire, have been referred by British authors to *H. sagittatum* subsp. *philanthrax* Dahlst. Bidrag. ii. p. 181. The specimens examined, however, have the broad, more or less truncate-based leaves of *H. sagittatum* Lindbg. In authentic foreign material of *H. philanthrax* the leaves are narrower and attenuate below, and no British specimens have been seen with this kind of foliage. The new epithet *oistophyllum* (arrow-leaved) is substituted for *sagittatum*, which is a later homonym. An Irish plant collected by Praeger at Poulaphuca, Co. Fermanagh, in 1904, closely resembles *H. oistophyllum*.

In the specimens examined of var. *abrasum* the leaves do not seem narrower than in the typical plant.

H. Sinclairii Dahlst. in Johnston, 'Additions to the Flora of Orkney', xv, pp. 5 and 6, in Trans. Bot. Soc. Edin. (1932), another native of Hoy, is very closely allied to *H. oistophyllum*. It differs from the typical species and from var. *abrasum* in the form and clothing of the heads, the phyllaries being narrow with much dark pilose and glandular hair. Judging from the two specimens seen, the leaf-cutting varies considerably. *H. Sinclairii* was founded by Dahlstedt on four examples from a single station in Hoy (Sinclair no. 716), and seven other specimens from an adjacent locality (Sinclair no. 715) were treated as a modification. This sparse material seems insufficient to warrant the establishment of a new species distinct from *H. oistophyllum*.

A similar plant is *H. sagitticeps* Dahlst. ap. Johnston (l. c. supra), founded on a single individual (Johnston no. 4425), also collected in Hoy. Another single specimen, identical with this, from a different station in Hoy, was named *H. subalpestrifrons* by Dahlstedt in 1929 (Vide Johnston no. 4241 A). This latter species is dealt with under *H. orcadense* W. R. Lint.

Of *H. orithales* Linton in Journ. Bot. xlix. 355 (1911) only one example has been traced. This is 'Marshall no. 3147', collected by the Kinnel Burn, near Moffat, and labelled '*H. sagittatum* var. *philanthrax*'. This specimen does not entirely

agree with Linton's description, its leaves being sagittate-based rather than 'narrowing below', and it seems clearly inseparable from *H. oïstophyllum*. It is not known where the other specimens cited by Linton as referable to *H. orithales* are now to be found.

Distribution.—64. M.W. Yorks : Knaresboro' ! Chapel-le-Dale (Ley). Buckden (Linton). 66. Durham : Upper Teesdale ! Weardalehead (Backhouse). 70. Cumberland : Alston (Waterfall). 72. Dumfries : Moffat (Marshall). 87. W. Perth : King's Seat Hill (Buchanan-White). 89. E. Perth : Glen Shee and Glen Beg (Marshall). 90. Forfar : Clova ! 92. S. Aberdeen : Braemar !

var. *abrasum*.

111. Orkney : Hoy (Johnston).

General Distribution (of the species).—Scandinavia, Denmark, Russia.

115. *HIERACIUM PYCNODON* Dahlstedt, Bidrag, iv. 251 (1894).

Exsicc.—Dahlst. H. Sc. iii. 70 ; xxii. 16.

Stem 20–40 cm. high, ±robust, very sparingly pilose below, becoming floccose with scattered pilose hairs above. *Radical leaves* not numerous, yellowish green ; the primordial small, subrotund-obovate, rounded-obtuse-mucronate, denticulate, abruptly narrowed below ; the later *oval* or the inner *oval-lanceolate*, rounded-obtuse-mucronate to acute, denticulate towards the apex, and *sinuate-dentate* below with spreading teeth increasing in length towards the ±*cordate* or *shortly narrowed base*, detached *teeth* sometimes *descending the long petioles* ; stem-leaf 1, lanceolate, acute, sharply toothed, petiolate ; all ±pilose on both surfaces and the margins, becoming villous on the midrib beneath and along the petioles. Inflorescence paniculate-corymbose, 2–7-headed, with rather short acladium and straight, spreading branches, which are densely floccose, with scattered pilose and fine, dark glandular hairs. *Heads of medium size or rather small, scarcely rounded below*. *Phyllaries* in bud, *olive-green*, rather narrow, lanceolate-subulate, *subacute*, floccose, *with abundant dark-based pilose and a few fine, shorter glandular hairs intermixed*. *Ligules glabro s-tipped*. *Styles yellow*. Margins of receptacle-pits Achenes reddish black, about 3 mm. long.

β. *acutidens* Dahlst. in Johnston, Add. Fl. Orkney, xii. 4–5, in Trans. Bot. Soc. Edin. (1929).

Exsicc.—Sinclair nos. 590 and 602.

Leaves sinuate-dentate with sharp, spreading teeth, the inner with subsagittate base. Phyllaries less floccose at the apex and margins. Otherwise like the type.

This plant is known from a single station only, Ward Hill, in Hoy, where it was collected by J. Sinclair in 1928.

Distribution.

var. *acutidens*.

111. Orkney : Hoy (Sinclair).

General Distribution (of the species).—Sweden.

116. *HIERACIUM SUBHIRTUM* (F. J. Hanbury) Pugsley in Journ. Bot. lxxix. 194 (1941).

H. rivale var. *subhirtum* Hanb. in Journ. Bot. xxxii. 228 (1894) ; in Bab. Man. ed. 9, 252 (1904) ; *H. silvaticum* var. *rivale* f. *subhirtum* Williams, l. c. 137 (1902) ; *H. sagittatum* var. *subhirtum* W. R. Lint. Brit. Hier. 52 (1905) ; *H. sagittatum* subsp. *sagittatum* var. *subhirtum* Zahn, l. c. 343 (1921).

Exsicc.—Hanbury, Corrie Ardran (type) and Glen Falloch, 1890, in Hb. Hanbury; Linton no. 137; Linton no. 16 (as *H. rivale*); Linton, Killin, 1894; Marshall nos. 1816, 3512 and 3835; all in Hb. Mus. Brit.

Stem 20–45 cm. high, slender, sparingly pilose, becoming also floccose upwards. *Radical leaves* normally few, bright or yellowish green, *very variable in form*; the primordial small, oval, rounded-obtuse-mucronulate, subentire, abruptly contracted below; the later *oval to lanceolate*, obtuse-mucronulate to sharply acute, *denticulate to sharply dentate* (especially in the lower half of the lamina), the base (generally asymmetrical) *cuneate, rounded or truncate*, often with long, horizontal teeth; stem-leaf 0.1(–2), placed low, petiolate and resembling the inner basal, or placed higher, linear and bractlike; all pilose with short, rough hairs above (or \pm glabrescent) and more softly so beneath, with shortly ciliate margins and \pm pilose petioles. Inflorescence racemose-corymbose, 2–6-headed, lax, with slender, \pm long, suberect branches and peduncles, which are floccose, with scattered fine pilose and occasionally a few glandular hairs. *Heads of medium size or rather small, obconic*, narrowed below. *Phyllaries* incumbent in bud, not numerous, *greyish green, lanceolate-subulate*, mostly acute, sparingly floccose, senescent, *with dense, pale, dark-based pilose hairs* and sometimes a few fine glandular hairs intermixed. *Ligules sparingly pilose-tipped*. *Styles fuscous*. Margins of receptacle-pits shortly dentate. Achenes blackish, 3.5–4 mm. long.

H. subhirtum is allied to *H. rivale* Hanb. of which it was first described as a variety, but it differs materially in its smaller heads with less floccose, more pilose and generally eglandular phyllaries. From *H. oëstophyllum* it may be distinguished by its more irregular leaf-cutting with a narrower cauline leaf, and by its obconic heads with less obtuse and less glandular phyllaries. It is not uncommon along rocky streams in western Inverness-shire.

Distribution.—72. Dumfries: Moffat (Linton). 88. Mid Perth: Killin (Linton). Luib and Glen Falloch (Marshall). Corrie Ardran (Hanbury). Ben Lawers (Roffey). 89. E. Perth: Pitlochry (Wilmott). 92. S. Aberdeen: Braemar! 97. W. Inverness: Ben Nevis! Glen Roy! Glen Spean! Moidart (Macvicar). Arisaig (W. F. Miller). 98. Argyll: Dalnally (Marshall). Clach Leathad (Hanbury).

Endemic.

117. *HIERACIUM RIVALE* F. J. Hanbury in Journ. Bot. xxxi. 19 (1893); in Bab. Man. ed. 9, 252 (1904); W. R. Lint. Brit. Hier. 51 (1905); *H. silvaticum* var. *rivale* Williams, l. c. 137 (1902); *H. sagittatum* subsp. *rivale* Zahn, l. c. 349 (1921); *H. caniceps* Hanb. in Journ. Bot. xxx. 368 (1892), non Norrlin in Hb. Mus. Fenn. cd. 2, i. 113 and 150 (1889).

Exsicc.—Linton, Ben Hope, 1886, and Skye, 1888; Marshall, Clach Leathad, 1888; Shoolbred, Ben Loyal, 1897; Marshall no. 3075; all in Hb. Mus. Brit.

Stem 25–50 cm. high, slender, striate, slightly pilose below, becoming floccose upwards, with scattered fine pilose and glandular hairs. *Radical leaves* generally few, bright green, paler or purplish beneath; the primordial small, oval, rounded-obtuse-mucronulate, subentire or denticulate, abruptly narrowed below; the later (often large) *oblong to lanceolate*, obtuse-mucronate to acute, *denticulate to sharply serrate-dentate* with teeth increasing downwards, *sometimes* elongate and *attenuate below*, *sometimes* broader with rounded, subtruncate or *sagittate base*; stem-leaf 0.1(–2), usually linear or linear-lanceolate, \pm toothed, sessile or shortly petioled, rarely placed low, petioled and resembling the innermost basal; all \pm pilose on both surfaces (sometimes glabrescent above) with ciliate margins and villous petioles. Inflorescence subracemose-corymbose, 3–10-headed, usually with moderate accladium and longer, slender branches and peduncles, which are floccose (often densely), with numerous

glandular and sometimes a few pilose hairs. *Heads of medium size to rather large, long and ±obconic, narrowed below or slightly rounded in fruit. Phyllaries porrect in bud, greyish green, rather broad, linear-lanceolate, elongate, obtuse or subacute, densely floccose, especially on the margins, usually with many dark glandular and dark-based pilose hairs. Ligules shortly pilose-tipped. Styles fuscous. Margins of receptacle-pits incise-dentate. Achenes blackish, 3.5-4 mm. long.*

This species was founded by Hanbury in 1892 (as *H. caniceps*) on specimens from several Highland localities, but two years later he separated the examples from some of these stations to form in part the basis of a new variety *subhirtum*. This variety was transferred to *H. sagittatum* by W. R. Linton (l. c.) and is here treated as a separate species, under which its points of difference from *H. rivale* have been indicated. *H. rivale* is separable from *H. oïstophyllum* by its narrower foliage, larger, obconic heads, and longer, less obtuse phyllaries with coarser and darker glandular hairs. The glandular development is indeed such as might warrant a place for the species in the Subsection *Glandulosa*.

To some extent *H. rivale*, like *H. pictorum*, recalls some species of the *Subalpina*, and Lindeberg remarked on a specimen sent by Hanbury from the Almond, in Perthshire, 'videtur forma *H. nigrescentis*.'

The specimen in Herb. Hanbury from Ben Hope, referred to *H. murorum* var. *morulum* Dahlst., seems to be a form of *H. rivale*.

Distribution.—57. Derby : Miller's Dale (Linton). 88. Mid Perth : Corrie Ardran (Linton). By Almond (Hanbury). 89. E. Perth : Blair Athol (Buchanan-White). Glen Shee and Blairgowrie (Marshall). Dalnaspidal (Roffey). 90. Forfar : Clova (Foggitt). 92. S. Aberdeen : Braemar ! 95. Elgin : Dumphail (Hanbury). 97. W. Inverness : Moidart (Macvicar). 98. Argyll : Clach Leathad (Hanbury). Oban (Shoolbred). 104. N. Eubodes : Cuchullins, Skye (Linton). 107. E. Sutherland : Oyckell Bridge (Marshall). 108. W. Sutherland : Ben Loyal (Marshall). Ben Hope (Linton).

Endemic.

118. HIERACIUM UISTICOLUM Pugsley in Journ. Bot. lxxix. (1941).

Exsicc.—Shoolbred, Lee Hills, N. Uist, 1898 (type), in Hb. Mus. Brit., as *H. rivale*.

Caulis 25-50 cm., inferne saepe rubescens, basi longe pilosus, sursum pilis tenuibus sparsis ± flocculosus. *Folia radicalia* pauca, laete viridia, subtus saepe rubro-tincta, plurima elliptica ad oblonga, obtuso-mucronata ad acuta, glanduloso-denticulata ad sinuato-serrata, basi abrupte angustata vel breviter cuneata ; caulina vulgo 2, inferius ellipticum ad lanceolatum, acuminatum, denticulatum ad grosse serratum, saepissime subpetiolatum, superius minus, lanceolatum, acuminatum, ± denticulatum, sessile ; omnia superne glabrescentia subtus parce pilosa, marginibus ciliatis petiolisque longe pilosis. Anthela paniculato-corymbosa, nonnunquam cum ramo inferiore longo, 2-12-cephala, pedunculis flocculosus pilis tenuibus sparsis glandulisque minutis vestitis. *Involucra mediocria, latiuscula, inferne rotundata. Squamae* in gemmis incumbentes, marginibus pallidioribus olivaceae, lineari-oblongae, obtusae, inferne floccosae, leviter senescentes, pilis multis basi obscuris glandulisque paucis minutis immixtis. *Ligulae apice glabrae. Styli lutei. Alveoli receptaculi* margine argute dentati.

Stem 25-50 cm. high, often reddish below, long-pilose about the base, becoming ± flocculose with scattered, fine pilose hairs upwards. *Radical leaves* few, bright green, often suffused with red beneath ; the primordial small, broadly oval, rounded-obtuse, subentire, abruptly contracted below ; the later elliptic to oblong, obtuse-mucronate to acute, glandular-denticulate to sinuate-serrate, abruptly narrowed below or shortly cuneate-based ; stem-leaves usually 2, the lower elliptic to lanceolate, acuminate, denticulate to coarsely serrate, usually subpetiolate, the upper smaller, lanceolate,

acuminate, \pm denticulate, sessile; all glabrescent above and sparingly pilose beneath, with ciliate margins and long-pilose petioles. Inflorescence paniculate-corymbose, sometimes with a long lower branch, 2–12-headed, the peduncles flocculose with scattered fine pilose and minute glandular hairs. *Heads of medium size, rather broad, rounded below. Phyllaries incumbent in bud, olive-green with paler margins, linear-oblong, obtuse, floccose below, slightly senescent, with many dark-based pilose and a few fine glandular hairs intermixed. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits sharply dentate. Achenes blackish, 3.5 mm. long.*

This plant was discovered, on his second visit to the Hebrides, by Shoolbred, who obtained a fine series of specimens. They were named '*H. rivale*' by E. F. Linton, but this identification was modified by Hanbury, who wrote 'Apparently a local form which had better go under var. *subhirtum* rather than the type'. *H. uisticolum* differs from *H. rivale* by its broader radical leaves and more developed stem-leaves, as well as by its broad, round-based heads with nearly eglandular phyllaries. Eglandular phyllaries are a feature of *H. subhirtum*, but this is readily separable from *H. uisticolum* by its narrower, more hirsute foliage and its smaller, obconic heads. Moreover, both in *H. rivale* and *H. subhirtum*, the styles are fuscous and not yellow. *H. uisticolum* was recently found by Miss M. S. Campbell in the Uig district of Lewis.

Distribution.—110. Outer Hebrides: N. Uist (Shoolbred). Uig, Lewis (Miss Campbell).

Endemic.

119. *HIERACIUM BREADALBANENSE* F. J. Hanbury in Journ. Bot. xxx. 260 (1892); in Bab. Man. ed. 9, 241 (1904); W. R. Lint. Brit. Hier. 50 (1905); *H. pictorum* var. *breadalbanense* Williams, l. c. 130 (1902); *H. sagittatum* subsp. *breadalbanense* Zahn, l. c. 347 (1921).

Exsic.—Linton no. 105 (Killin, cult.); W. R. Linton, Killin and Loch-na-Chait, 1891; Linton, Loch-na-Lairige, 1892; all in Hb. Mus. Brit.

Stem 30–50 cm. high, robust, sparingly pilose and floccose. *Radical leaves* yellowish green, paler beneath; the primordial broadly oval, rounded-obtuse-mucronulate, denticulate, abruptly narrowed below; the later *oval or elliptic to elliptic-lanceolate, obtuse-mucronate to acute, glandular-denticulate* or with a few shallow teeth about the *rounded* or abruptly contracted *base*; stem-leaf usually 1, elliptic-lanceolate to lanceolate, acuminate, often sharply toothed, \pm petiolate; all \pm pilose on both surfaces with rather short, rough hairs, with ciliate margins and \pm villous petioles. Inflorescence paniculate-corymbose, sometimes with a long lower branch, 2–10-headed, generally with rather short peduncles, which are flocculose with numerous fine, spreading pilose hairs. *Heads of medium size, rounded-based. Phyllaries connivent in bud, dark green, linear-lanceolate, subacute, moderately floccose below, with numerous dark-based pilose hairs, glandular hairs usually wanting. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits sharply dentate ap. W. R. Linton. Achenes blackish, 3.5 mm. long.*

This local species, apparently almost confined to the Breadalbane district in Perthshire, is distinguishable by its robust habit with rather broad, slightly toothed and roughly hirsute leaves, and its rounded, normally eglandular heads.

Distribution.—88. Mid Perth: Ben Lawers! Cam Creag! Killin (Linton). 89. E. Perth: Glen Shee (Linton).

Endemic.

120. *HIERACIUM CREBRIDENTIFORME* Pugsley in Journ. Bot. lxxix. 195 (1941).

H. crebridens W. R. Lint. Brit. Hier. 48 (1905), ex parte ? non Dahlst. ; *H. crebridens* Linton, Ley and Cryer in sched.

Exsicc.—Pugsley nos. 552 (type) and 553, in Hb. Pugsley ; Linton no. 174 (Chapel-le-Dale, 1902) ; Riddelsdell, Birkwith Glen, 1903 ; Cryer, Linton and Arncliffe, 1913, and Ingleton and Clapham, 1923 ; all as *H. crebridens* in Hb. Mus. Brit.

Caulis 30–50 cm., ±robustus, basin versus pilosus et saepe purpurascens, sursum glandulis paucis obscuris ±floccosus. *Folia radicalia* pauca, laete viridia, saepe subtus et nonnunquam in paginâ superiore valde purpurascentia, plurima vulgo ±magna, ovalia ad oblongo-lanceolata (raro latiora), subacuta ad acuminata, leviter denticulata et plerumque basin abrupte contractam versus (interdum per omnes partes) dentibus argutis patulis sinuato-dentata ; caulinum 0–1, lineare, integrum, ad ovato-lanceolatum, grosse dentatum, petiolatum ; omnia in paginâ utrâque cum marginibus crinibus breviusculis asperulis pilosa, petiolis longis gracilibus ±villosis. *Anthela* acladio longiusculo ramisque longioribus, gracilibus, undulatis furcato-corymbosa, 2–10-cephala, pedunculis ±dense floccosis glandulis obscuris numerosis pilisque paucis vestitis. *Involucra majuscula, angusta, inferne vix rotundata vel attenuata. Squamae* in gemmis ±porrectae, marginibus pallidis obscure virides, lanceolato-subulatae, acutae vel intimae attenuatae, praesertim basin versus floccosae, pilis obscuris multis glandulisque brevioribus paucioribus immixtis. *Ligulae apice parce pilosae. Styli fusi vel lividi.* Alveoli receptaculi margine argute subulato-dentati.

Stem 30–50 cm. high, ±robust, striate, often purplish about the base, pilose (chiefly below) and ±floccose, with a few dark glandular hairs upwards. *Radical leaves* few, bright green, often richly purpurascens beneath and sometimes also above ; the primordial, when produced, small, subrotund, with rounded-obtuse apex, subentire and abruptly narrowed below ; the later, frequently large, oval to oblong-lanceolate (rarely broader), subacute to acuminate, finely denticulate and generally sinuate-dentate with sharp, spreading teeth towards the abruptly contracted base (sometimes throughout) ; stem-leaf 0–1, linear and entire, or ovate-lanceolate, coarsely toothed and petioled ; all pilose on both surfaces and on margins with rather short, rough hairs, the long, slender petioles ±villos. *Inflorescence* furcate-corymbose, 2–10-headed, with rather long acladium and longer, slender, undulate branches ; peduncles ±densely floccose with numerous dark glandular and fewer pilose hairs. *Heads* rather large, narrow, scarcely rounded or attenuate below. *Phyllaries* ±porrect in bud, dark green with paler margins, lanceolate-subulate, acute, or the inner attenuate, floccose chiefly towards the base, with many dark pilose and fewer, shorter glandular hairs. *Ligules sparingly pilose-tipped. Styles fuscous or livid.* Margins of receptacle-pits sharply subulate-dentate. Achenes blackish, about 4 mm. long.

This well-marked hawkweed grows in several places in West Yorkshire, and has been repeatedly sent out by Linton, Ley and Cryer as *H. crebridens* Dahlst., with which it seems to have been erroneously identified. There are five authentic sheets of Dahlstedt's species at Kew, including Dahlst. H. Sc. iii. 65 and 66, xiii. 53, and xix. 37, and these show a more or less slender plant with long-petioled, glaucous, rather broadly lanceolate leaves, deeply toothed in the lower half, and subtruncate-based, and medium-sized, narrow heads with obtuse, dark, eglandular phyllaries, and many dark pilose hairs both on the phyllaries and the peduncles. This plant is placed by Dahlstedt near *H. silvaticum* Alm. and would clearly fall within our Subsection *Bifida*. *H. crebridentiforme* is a much more robust plant, with green, hirsute foliage, and larger, more glandular heads. In its obconic heads it bears some resemblance to *H. rivale*, and from its aggregate of characters is best placed among the *Sagittata*. The sheet in Herb. Hanbury of Linton no. 176 (*H. sagittatum* var. *lanuginosum*—Ribblehead) is *H. crebridentiforme*.

Distribution.—64. M.W. Yorks : Chapel-le-Dale (Ley). Ribblehead ! Ingleton ! Settle (Hanbury). Linton and Arncliffe (Cryer).

Endemic.

121. *HIERACIUM AURATIFLORUM* Pugsley in Journ. Bot. lxxix. 195 (1941).

Icon.—Pl. 7, fig. a.

Esicc.—Pugsley, Upper Teesdale, 1896, 1903 (type), 1930 and 1933. Groves, Harwood Gill; all in Hb. Pugsley.

Caulis 30–60 cm., *robustus*, *striatus*, praesertim basin versus parce pilosus, sursum leviter floccosus. *Folia radicalia* vulgo pauca, *membranacea* et valde venosa, *obscura viridia*, plurima magna, *ovalia ad elliptica*, subacuta ad breviter cuspidata, *sinuato-denticulata ad argute et irregulariter sinuato-dentata*, dentibus infimis prope basin *rotundatam vel subcordatam* saepe deflexis; caulinum 0–1, parvum, bracteaforme, vel in cultis ovatum, acuminatum, dentatum, petiolatum; omnia in paginâ superiore crinibus brevibus satis rigidis vestita, subtus parcius et longius pilosa, marginibus breviter ciliatis petiolisque longiusculis modice pilosis. *Anthela* pedunculis arcuatis patentibus et saepe ramo inferiore longo *laece paniculato-corymbosa*, 2–12-cephala, pedunculis dense floccosis glandulis obscuris numerosis pilisque nonnullis obsitis. *Involucra majuscula, basi ovata. Squamae* in gemmis incumbentes, marginibus pallescentibus *griseo-virides*, lineari-oblongae, obtusae, saepe dense floccosae, \pm senescentes, *pilis multis longis basi obscuris glandulisque brevioribus* \pm *numerosis restituae*. *Ligulae* aureae, *apice glabrae*. *Styli mellini*. Alveoli receptaculi margine subulato-dentati.

Stem 30–60 cm. high, *robust*, *striate*, sparingly pilose (especially below) and becoming slightly floccose above. *Radical leaves* generally few, *membranous* and strongly veined, *dark green*; the primordial (if present) subrotund-oval, subacute, with a few coarse teeth and abruptly narrowed below; the later large, *oval to elliptic*, subacute to shortly cuspidate, *sinuate-dentate to sharply and irregularly sinuate-dentate* with the lowest teeth often deflexed about the *rounded or subcordate base*; stem-leaf 0 or 1, small and bractlike, or ovate, acuminate, toothed and petiolate in cultivation; all clothed with rather stiff, short hairs on the upper surface and more sparingly with longer hairs beneath, the margins shortly ciliate and the rather long petioles moderately pilose. *Inflorescence laxly paniculate-corymbose*, 2–12-headed, with arcuate, spreading peduncles and often a long lower branch, the peduncles densely floccose with numerous dark glandular and some pilose hairs. *Heads rather large, ovate-based. Phyllaries* incumbent in bud, *greyish green* with paler margins, linear-oblong, obtuse, often densely floccose, \pm *senescent, with many long, dark-based pilose and* \pm *numerous shorter glandular hairs*. *Ligules* golden-yellow, *glabrous-tipped*. *Styles dull yellow*. Margins of receptacle-pits subulate-dentate. Achenes reddish-black, about 4 mm. long.

This handsome hawkweed, which keeps its characters almost unchanged under cultivation and is ornamental in the garden, was noticed on each visit to Upper Teesdale over a period covering nearly forty years, and occurs in the neighbouring Harwood Gill, in Durham, and probably in other localities in Yorkshire.

It is distinguished by its thin, dark green, sinuate-dentate leaves, and its broad, spreading panicle of showy golden-flowered heads with greyish green, pilose and glandular phyllaries. It is closely allied to the preceding species, *H. crebidentiforme*, but differs in its broader and darker green foliage and its paniculate inflorescence with ovate-based heads. It has sometimes been referred, like its ally, to *H. crebidentens* Dahlst., under which name there is excellent material in Herb. Hanbury.

Distribution.—65. N.W. Yorks: Upper Teesdale! 66. Durham: Upper Teesdale! Harwood Gill (Groves).

Endemic.

122. *HIERACIUM LINTONII* Ley in Journ. Bot. xlvii. 16 (1909); *H. sagittatum* var. *maculigerum* W. R. Lint. Brit. Hier. 53 (1905); *H. sagittatum* subsp. *Loennrothianum* var. *maculigerum* Zahn, l. c. 344 (1921).

Exsicc.—Ley, Catterick Glen and Moughton Scars, 1903 ; Arncliffe, 1904 ; Craig Gledsiau, 1905 ; Fanfechan, 1905 ; Riddelsdell, Cellwen, 1906 ; Linton no. 177 (Upper Wharfedale) partim ; all in Hb. Mus. Brit.

Stem 25–60 cm. high, *robust*, pilose below with pale, spreading hairs, sparingly floccose above with \pm numerous black-based, readily deciduous pilose hairs. *Radical leaves* usually few, deep green, *often marked with brownish purple* and purple-tinted beneath ; the primordial small, broadly oval, rounded-obtuse-mucronate, denticulate, subtruncate-based ; the later *oblong, elliptic- or ovate-lanceolate*, acute to acuminate, *denticulate or with sharp, spreading teeth* increasing downwards, *shortly attenuate below to sagittate-truncate* ; stem-leaf usually 1, rarely 2, \pm large, ovate-lanceolate, acuminate, with deep, sharp, spreading teeth, abruptly contracted to a distinct, winged petiole, more rarely small and bractlike ; all \pm pilose on both surfaces (especially on the mid-rib beneath), with ciliate margins and long-villous petioles. *Inflorescence paniculate-corymbose*, sometimes with a long lower branch, 2–8(–20)-headed, with erect-spreading peduncles, which are floccose with numerous dark pilose and sometimes a few shorter glandular hairs. *Heads rather large, ovate-based. Phyllaries* incumbent in bud, *blackish green*, rather broad, linear-lanceolate, mostly obtuse, sparingly floccose, *with numerous long, dark pilose and fewer short glandular hairs*. *Ligules* golden-yellow, *glabrous- or \pm pilose-tipped*. *Styles yellowish*. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

This plant was first described by W. R. Linton (l. c.) as a West Yorkshire variety of *H. sagittatum* Lindbg. near var. *lanuginosum* Lönnr., but differing in the colour of its leaves, the broader stem-leaf, and the more glandular and less pilose heads. A specimen was submitted in 1907 to Dahlstedt, who pronounced it 'not to belong to the *sagittatum* group of forms', and in 1909 it was raised to specific rank as *H. Lintonii* by Ley, who recorded it also for Brecon. Dahlstedt was evidently right in dissociating it from *H. sagittatum*, and the British plant described by W. R. Linton (l. c.) as *H. sagittatum* var. *lanuginosum* Lönnr. seems to have been equally misidentified, for Lönnroth's plant (cf. Dahlst. H. Exs. i. 50) has the smaller heads of *H. sagittatum*, combined with narrow, serrate foliage, often attenuate below. There has clearly been much confusion respecting the variety *lanuginosum*, and the set 'Linton no. 176. *H. sagittatum* var. *lanuginosum*. Ingleton, 1903', as represented in Herb. Mus. Brit., does not belong to this group at all but is a form of *H. silvaticum* Gouan ap. W. R. Linton, doubtfully separable from his var. *subcyaneum*.

H. Lintonii is normally a robust plant, with broad, hirsute foliage, a well-developed, deeply toothed stem-leaf, and rather large heads, that is not readily to be confused with *H. oïstophyllum* Pugs. (*H. sagittatum* Lindbg.). It is not always easily separable from forms of *H. rubiginosum* Hanb., and the exsiccata Linton no. 91, as *H. rubiginosum* (cult., orig. Settle) is partly this plant.

Slenderer forms from Yorkshire, with narrower foliage and smaller heads, have been referred to *H. Lintonii*, and some doubt exists as to their real affinity.

Distribution.—42. Brecon : Craig Gledsiau and Craig Rhiwarth (Ley). Cellwen (Riddelsdell). 44. Carmarthen : Fanfechan (Ley). 64. M.W. Yorks : Grassington ! Settle (Linton). Smearsett Scar (Hanbury). Ribblesdale ! Kettlewell, Moughton and Arncliffe (Ley). 65. N.W. Yorks : Catterick (R. F. Thompson).

Endemic.

Series **Fimbriata.** (See page 158.)

123. *HIERACIUM EUPREPES* F. J. Hanbury in Journ. Bot. xxx. 206 (1892) ; in Bab. Man. ed. 9, 254 (1904) ; Williams, l. c. 148 (1902) ; W. R. Lint. Brit. Hier. 56 (1905) : *H. sagittatum* subsp. *euprepes* Zahn, l. c. 348 (1921).

Icon.—Pl. 7, fig. b.

Exsicc.—Linton no. 66 (Belfast); Ley, Black Mt. and Llyn-fan-fechan, 1898, and Dyffryn Cwannon, 1908; W. R. Linton, Moffat, 1896; Marshall nos. 2333 and 4097; all in Hb. Mus. Brit.

Stem 20–50 cm. high, robust, striate, \pm densely pilose with spreading hairs and floccose upwards (often rough with the bases of deciduous hairs). *Radical leaves spreading*, dull green, paler or tinted with red beneath; the primordial, if present, small, oblong, rounded-obtuse-mucronulate, subentire, abruptly narrowed below; the later often large, *elliptic to oblong or ovate-lanceolate*, obtuse-mucronate to acute, *denticulate or shallowly undulate-dentate*, cuneate or abruptly narrowed below to short petioles; stem-leaves 1–2, the lower placed low, lanceolate, acuminate, denticulate or finely dentate, \pm petiolate, the upper \pm bractlike; all \pm pilose on both surfaces with short, subsetiform hairs, with ciliate margins and villous petioles. *Inflorescence* paniculate-corymbose, often dense but with a long, suberect lower branch, 2–16-headed, *with very short accladium and adjacent peduncle, giving the appearance of geminate terminal heads*, peduncles (usually densely) floccose, with many pilose but few or no glandular hairs. *Heads of medium size, narrow, subcylindric, subtruncate-based in fruit.* *Phyllaries* connivent in bud, *dark or blackish green*, the inner with paler margins, *few, broad, linear-oblong, obtuse, sparingly floccose, with numerous dark-based pilose hairs, glandular hairs few or none.* *Ligules glabrous-tipped.* *Styles yellowish.* *Margins of receptacle-pits obscurely dentate, strongly fimbriate.* Achenes blackish, about 3.25 mm. long.

H. euprepes is one of our most distinct hawkweeds owing to its robust habit, with rough, shortly petioled foliage, its apparently geminate accladium, and its narrow heads with few, broad phyllaries. It is likewise notable for its dentate-fimbriate receptacle-pits. Its position in the genus is perhaps debatable. Hanbury placed it among his *Vulgata Caulescentia*, and W. R. Linton at the head of the *Caesia*, remarking that it was somewhat intermediate between this group and his *Subvulgata*, in which *H. sagittatum* appears.

Linton's set no. 66 (*H. euprepes*) is a mixture. The Cave Hill, Belfast, plant is correctly placed, but that from Melvich is entirely different and appears to be luxuriant *H. caledonicum*! The varieties *glabratum* Linton and *clivicolum* Hanb. are here treated as distinct species. The variety *pruiniferum*, described by W. R. Linton (Brit. Hier. p. 57) from two localities in Perth and Forfar, is represented in Herb. E. F. Linton (now in Herb. Mus. Brit.) by two sheets showing what seem to be the original specimens. In Journ. Bot. xxxi. (1893) Messrs. Linton recorded *H. submurorum* Lindbg. from the same two stations, and the specimens on which the account of var. *pruiniferum* was based appear to be those originally recorded as *H. submurorum*. Dahlstedt pointed out in 1907 that these plants did not belong to the group of *euprepes*. In Zahn's work (p. 328) *H. euprepes* var. *pruiniferum* Lint. becomes *H. murorum* subsp. *pruinale* Zahn.

Distribution.—35. Monmouth: Black Mt. (Ley). 36. Hereford: Hatterel Hills (Ley). 42. Brecon: Craig Gledsiau (Hanbury). Dyffryn Cwannon (Ley). 44. Carmarthen: Fanfechan (Ley). 49. Carnarvon: Llyn-an-Afon! Cwm Glas (Lloyd-Williams). Carnedd Dafydd (Ley). 72. Dumfries: Moffat (Linton). 87. W. Perth: Loch Voil (Buchanan-White). 88. Mid Perth: Glen Lochay (Linton). 96. E. Inverness: Bridge of Brown (Roffey). 97. W. Inverness: Aonach Beg (Linton). 108. W. Sutherland: Armadale (Marshall). 109. Caithness: Thurso (Marshall).

Ireland.—39. Antrim: Cave Hill (Stewart). Knock Dhu! Red Bay (Shoolbred). 40. Londonderry: Benevenagh (Stewart).

Endemic.

124. *HIERACIUM ORCADENSE* W. R. Linton in Journ. Bot. xxxi. 196 (1893) ; Brit. Hier. 65 (1905) ; Hanb. in Bab. Man. ed. 9, 254 (1904) ; *H. subramosum* subsp. *orcadense* Zahn, l. c. 462 (1921) ; *H. holopleurum* Dahlst. (1899) in Johnston, Add. Fl. Orkney, xi. 11, 12, in Trans. Bot. Soc. Edin. (1928) ; *H. subalpestrifrons* Dahlst. in Johnston, Add. Fl. Orkney, xii. 7, 8, t. c. (1929) ; *H. paraliaeforme* Dahlst. in Johnston, Add. Fl. Orkney, xv. 7, 8, t. c. (1932) ; *H. kalsoense* Dahlst. subsp. *burnense* Druce and Zahn in B. E. C. Report, ix. pt. 5, 559 (1932) ; *H. subexpallescens* Dahlst. in Johnston, Add. Fl. Orkney, xvi. 3-5, t. c. (1933).

Ersicc.—Linton, Hoy, 1886 ; Hanbury, Quoy Hamars, Hoy, 1894 ; Linton no. 142 (South Burn and Dwarfie Hamars, Hoy), all in Hb. Mus. Brit. ; Johnston nos. 3138 A, 4011, 4037, 4038, 4245, 4279, 4732, 4734 and 4743 ; Sinclair nos. 565, 660, 662 and 717 ; Druce, Hoy, 1931, as *H. kalsoense* subsp. *burnense*.

Stem 25-50 cm. high, reddish and pilose below, \pm floccose with scattered dark-based pilose and fine glandular hairs above. *Radical leaves* (often few) not spreading, deep green ; the primordial broadly oval, rounded-obtuse-mucronulate, sparingly denticulate, abruptly narrowed to the petioles ; the later *oblong to lanceolate*, obtuse-mucronate to acute, *denticulate or with a few broad, shallow, spreading teeth*, \pm *cuneate-based* ; stem-leaves 1-2(-3), the lower petioled and resembling the inner basal, the upper smaller, toothed or not, sessile ; all pilose on both surfaces and on margins with stiff hairs (or the stem-leaves \pm glabrescent), petioles villous. *Inflorescence* compactly paniculate-corymbose, (2-)4-12-headed, *the accladium and adjacent peduncle generally very short and geminate as in H. euprepes*, and the apical heads of the lower branches sometimes similarly so ; peduncles floccose with \pm numerous pilose and fine glandular hairs. *Heads rather small and narrow*, subtruncate-based. *Phyllaries* incumbent in bud, *dark green* with wide, paler margins, *few and broad*, linear-oblong, obtuse, floccose chiefly towards the base, strongly senescent, *with many dark-based pilose and fewer fine glandular hairs*. *Ligules* golden-yellow, *glabrous-tipped*. *Styles livid*. Margins of receptacle-pits (dentate-fimbriate ?). Achenes blackish, about 3.5 mm. long.

This local plant, only known from Hoy, where it seems to be not uncommon, and more recently from Mainland, Orkney, has received a plethora of names in recent years. In 1928 it was referred to *H. holopleurum* Dahlst. by Dahlstedt himself, and the following year, when further specimens were sent to him, he described it as a new species, *H. subalpestrifrons*. In 1932 it received two further names. A specimen sent by Druce to Zahn was described as a new subspecies *burnense* of *H. kalsoense* Dahlst., and another, forwarded by Col. Johnston to Dahlstedt, formed the basis of a fresh new species *H. paraliaeforme* Dahlst. A comparison of specimens at once shows that all of these names have been applied to a single species *H. orcadense* W. R. Lint. Cryer in 1925 erroneously referred this plant (Johnston no. 3138A) to *H. silvaticum* var. *subtenu* W. R. Lint. and later identical gatherings were confused by Dahlstedt with this variety and with his *H. sagitticeps*, which is related to *H. oistophyllum*. Finally in 1933 a pale-headed or shade-grown form of this plant from Hoy was again described as a new species, *H. subexpallescens*, by Dahlstedt. There is no reference to *H. orcadense* in the descriptions of any of these reputed new species.

H. orcadense seems to be closely allied to *H. euprepes*, and also recalls *H. venniconium* Pugsley. It appears among the *Eu-Vulgata* in 'British Hieracia', but in Babington's Manual it is placed by Hanbury next after *H. euprepes* in the *Vulgata Caulescentia*.

Distribution.—111. Orkney : Hoy (Linton). Orphir, Mainland (Johnston).

Endemic.

125. *HIERACTIUM CLIVICOLUM* (F. J. Hanbury) Pugsley in Journ. Bot. lxxix. 195 (1941).

H. euprepes var. *clivicolum* Hanb. in Journ. Bot. xxxii. 228 (1894); W. R. Lint. Brit. Hier. 57 (1905); *H. sagittatum* subsp. *euprepes* var. *clivicolum* Zahn, l. c. 348 (1921).

Exsicc.—Ley, Brecon Beacons, 1896 (type), in Hb. Hanbury; Ley, Black Mt., 1898, and Glen Collwng, 1902, also Dyffryn Crawnnon, 1908; all in Hb. Mus. Brit.

Stem 30–45 cm. high, \pm robust, striate, clothed with whitish pilose hairs (dark-based in the upper part), which are readily deciduous and, when fallen, leave the stem scaberulous; becoming also floccose above. *Radical leaves* usually few, *spreading*, dull bluish green; the primordial small, apparently rarely produced; the later large, *ovate-lanceolate to lanceolate*, obtuse-mucronate to acute, *denticulate to undulate-dentate* with shallow teeth, \pm *shortly cuneate-based* (sometimes asymmetrically) *with rather short petioles*; stem-leaves usually 2, the lower lanceolate or linear-lanceolate, denticulate to sharply dentate (sometimes with long, narrow teeth), subpetiolate or sessile, the upper small, linear, bractlike; all \pm pilose on both surfaces with rough, subsetiform hairs, the margins ciliate and petioles villous. *Inflorescence paniculate-corymbose, compact*, with \pm short, incurved peduncles, 3–6(–12)-headed, the peduncles densely floccose, with numerous spreading, dark-based pilose hairs, almost eglandular. *Heads of medium size or rather large*, rounded below. *Phyllaries* incumbent in bud, *dark green, rather broad*, linear-lanceolate, mostly obtuse, floccose especially on the tips and margins, *with dense, dark-based pilose hairs intermixed occasionally with a few fine glandular hairs*. *Ligules glabrous-tipped*. *Styles yellow*. *Margins of receptacle-pits sharply dentate-fimbriate*. Achenes blackish, 3.5 mm. long.

This plant closely resembles *H. euprepes* in stem and foliage, but lacks the characteristic panicle of narrow heads with few, broad phyllaries and the pseudogeminate accladium. It is therefore treated as a separate species. Its inflorescence recalls that of *H. proximum* Hanb. or *H. farrense* Hanb., of the Subsection *Caesia*, but it differs widely from these plants in its subscapiform habit. According to Hanbury (l. c.) it was first collected by Ley in 1890, but the earliest specimen now in his herbarium is dated 1896, and this has been treated as the specific type.

Distribution.—42. Brecon: Dyffryn Crawnnon, etc. (Ley). 44. Carmarthen: Fanfechan (Riddelsdell).

Endemic.

Subsection CAESIA.

W. R. Linton, Brit. Hier. 5 and 56 (1905), emend; Zahn, l. c. 285, with *H. caesium*, *H. subramosum* and *H. angustatum* Zahn, l. c. 436, 457 and 469 (1921), pro maj. parte.

Subcauligerous (occasionally hypophyllopodous) plants, with the stem \pm pilose or glabrescent, usually floccose above; stem-leaves 1–3(–5), decreasing upwards, the lowest generally large. *Radical leaves* glaucescent, or dull, light or bright green, \pm *cuneate-based* (rounded below in *H. Leyianum* and sometimes in *H. holophyllum*), never truncate-based or with retrorse teeth. *Inflorescence furcate, racemose, or paniculate-corymbose*. Heads rarely numerous unless in cultivation, small to rather large, rounded- or \pm truncate-based. *Phyllaries* incumbent in bud, densely or slightly floccose, often with relatively short pilose hairs, and generally fewer, shorter glandular hairs. *Ligules glabrous- or more rarely pilose-tipped*. *Styles yellow to livid*. *Margins of receptacle-pits dentate or subulate-dentate* (dentate-fimbriate in *H. Leyianum*).

The Subsection *Caesia* includes a large number of varying forms, most of which bear some resemblance to *H. caesium* Fr., as understood in an aggregate sense. They are generally characterized by pale green or glaucescent, cuneate-based foliage, one or few stem-leaves, and but slight glandular clothing on the phyllaries. The best

marked species have greyish green, densely floccose involucre, and in several cases the minute floccose hairs form a finely tomentose margin to the phyllaries, which becomes more pronounced towards the apex, where it is merged in the terminal tuft (senescent). These species usually produce a compact, more or less paniculate inflorescence, as do some others in which the heads are conspicuously dark in colour, with an almost complete absence of floccose clothing. Other species again, like *H. caesiomurorum*, tend to develop a lax, furcate inflorescence. The Caesian species have been less studied in this country than most of the other groups, and some forms from Scotland and Ireland have never yet been described.

The species of this Subsection are chiefly plants of Scandinavia and Northern Europe, although Zahn gives France and Central Europe as producing *H. caesium* Fr. In Britain nearly all of them are rare plants, several known from a single station only. Seventeen of the twenty-three species are endemic. As might be expected, they predominate in Scotland, where eighteen species are known. Eleven are inhabitants of the English Lake District and of Yorkshire or Derbyshire, while six are recorded from Wales and four from Ireland. A solitary species, *H. angustisquamum*, grows at Cheddar, in Somerset.

Series *Angustata* [Grex *H. angustatum* Lindbg.].

Heads dark or blackish green, sparingly floccose.

* Leaves glaucescent. Panicle small or compact.

- | | |
|--|----------------------------------|
| Radical leaves small, lanceolate, finely serrate. Heads few and small ;
phyllaries broad, with scattered pilose and few minute glandular
hairs | <i>H. angustatum</i> . |
| Radical leaves lanceolate, denticulate. Heads rather small ; phyllaries
with fine, dark glandular and pilose hairs | <i>H. rhomboides</i> . |
| Radical leaves oval, sinuate-dentate. Heads of medium size ; phyl-
laries with dark pilose and shorter glandular hairs | <i>H. melanochloricephalum</i> . |

** Leaves \pm bright green. Panicle laxer.

- | | |
|--|---------------------------|
| Radical leaves oblong, sinuate-dentate with blunt teeth. Heads of
medium size ; phyllaries broad, obtuse, with dark pilose and
fewer, shorter glandular hairs | <i>H. stenophyes</i> . |
| Radical leaves oblong, \pm sharply serrate. Heads of medium size with
short accladium ; phyllaries broad, obtuse, with dark pilose and
shorter glandular hairs | <i>H. vennicentium</i> . |
| Radical leaves narrowly lanceolate, with long, ascending teeth. Heads
of medium size ; phyllaries obtuse, with dark pilose and few
shorter glandular hairs ; ligules \pm pilose-tipped | <i>H. anfractiforme</i> . |

Series *Dissimilia*. [Grex *H. dissimile* Lindbg.].

Heads usually olive or dark green, moderately floccose and often \pm densely pilose.

Ligules \pm pilose-tipped except in *H. rubiginosum*.

* Leaves bright green. Phyllaries \pm pilose.

- | | |
|--|---------------------------|
| Radical leaves oblong-lanceolate, \pm inciso-dentate, \pm glabrescent
above. Heads rather large ; phyllaries \pm greyish green, senescent,
with dense pilose and shorter glandular hairs | <i>H. caesiomurorum</i> . |
| Radical leaves lanceolate, inciso-dentate, with sharp, \pm spreading
teeth. Heads (in British forms) of medium size or rather large ;
phyllaries dark green, with many pilose and some dark glandular
hairs | <i>H. dissimile</i> . |
| Radical leaves few, oblong, with distant teeth. Heads of medium
size ; phyllaries with dark pilose and few minute glandular hairs .. | <i>H. subramosum</i> . |

** Phyllaries densely long-pilose.

- | | |
|---|-------------------------|
| Radical leaves bright green, lanceolate, with sharp, ascending teeth.
Heads of medium size ; phyllaries often nearly eglandular | <i>H. orarium</i> . |
| Radical leaves pale green, narrowly oblong, sinuate-dentate. Heads
small, terminal often geminate ; phyllaries normally eglandular . | <i>H. cravoniense</i> . |
| Radical leaves dull green, ovate-lanceolate, finely dentate. Heads
rather large ; phyllaries broad, with normally few glandular
hairs | <i>H. rubiginosum</i> . |

Series *Eu-Caesia* [Grex *H. caesium* Fr.].

Heads greyish green, densely floccose, especially on the margins.

* Leaves sharply or distinctly serrate or dentate, caesious or pale green.

- Radical leaves caesious, oval-lanceolate, incise-sinuate, pilose. Heads of medium size; phyllaries with dense long pilose and few fine glandular hairs. Ligules pale yellow *H. caesiopilosum*.
 Radical leaves caesious, oblong-lanceolate, finely serrate. Heads of medium size; phyllaries with numerous pilose and dark glandular hairs. Styles pure yellow *H. decolor*.
 Radical leaves glaucescent, elliptic-lanceolate, sharply serrate. Heads of medium size; phyllaries with many dark pilose and short glandular hairs. Ligules orange-yellow *H. fulvocaesium*.
 Radical leaves pale yellowish green, oblong, sinuate-dentate. Heads of medium size; phyllaries with many pilose hairs, eglandular. Ligules orange yellow *H. erythraeum*.

** Leaves subentire or obscurely toothed.

† Inflorescence paniculate-corymbose.

- Radical leaves pale green, lanceolate, denticulate. Heads of medium size; phyllaries with short pilose and fine glandular hairs *H. farrense*.
 Radical leaves pale green, ovate-oblong, subentire, setose. Heads large; phyllaries with many pilose hairs, subglandular *H. proximum*.
 Radical leaves bright green, oblong, subdenticulate. Heads of medium size; phyllaries with dark pilose and fine, short glandular hairs. . . . *H. angustisquamum*.

†† Inflorescence furcate- or racemose-corymbose.

- Radical leaves light green, lanceolate, subentire. Heads few, of medium size; phyllaries narrow, with numerous dark glandular and long, pilose hairs. Ligules pilose-tipped *H. eustales*.
 Radical leaves deep green, narrow-oblong, slightly dentate. Heads few, rather large; phyllaries broad, obtuse, with many short pilose and dark glandular hairs *H. insulare*.
 Radical leaves deep caesious, broadly ovate, denticulate. Heads rather large (generally stylose-flowered); phyllaries very broad, obtuse, with many pilose and few short, dark glandular hairs. Alveoles marginally dentate-fimbriate *H. Lepianum*.
 Radical leaves deep caesious, oval, normally subentire. Heads of medium size; phyllaries broad, obtuse, with ± numerous pilose and very few fine glandular hairs. *H. holophyllum*.

Series **Angustata**. (See page 170.)

126. *HIERACIUM ANGUSTATUM* Lindeberg in Blytt, Norges Fl. ii. 656 (1874); Hanb. in Journ. Bot. xxx. 133 (1892); in Bab. Man. ed. 9, 259 (1904); W. R. Lint. Brit. Hier. 66 (1905); *H. angustatum* subsp. *angustatum* Zahn, l. c. 470 (1921); *H. caesium* var. *angustatum* Lindbg. Hier. Scand. Exs. ii. 64 (1872); *H. orarium* var. *angustatum* Williams, l. c. 150 (1902).

Essicc.—Lindbg. H. Sc. ii. 64 and iii. 128; Shoolbred, Cwm-Taffeehan, 1896, as *H. caesium*; Linton no. 150 (Glen Taffeehan); all in Hb. Mus. Brit.; Fox, Dolly-waggon, 1890; Addison, Ennerdale, 1867; both in Hb. Hanbury.

Stem 15–40 cm. high, *very slender*, sometimes purplish below, slightly pilose about the base, glabrescent above, becoming slightly flocculose with occasional pilose hairs. *Radical leaves* (all subsimilar in specimens seen) few, *small, glaucescent, lanceolate* or elliptic-lanceolate, acute, rather *finely serrate* with the largest teeth about the middle of the lamina, *cuneate-based*; stem-leaves 1–2, small, lanceolate to linear-lanceolate, denticulate, generally sessile; all glabrescent *above* and slightly pilose beneath, the margins ciliate (often obscurely, but strongly in the Taffeehan form) and the petioles ± pilose. *Inflorescence furcate-corymbose*, 1–4(–6)-headed, with ± long slender, sub-erect branches exceeding the accladium, the peduncles ± flocculose with some fine spreading pilose and rarely a few minute glandular hairs. *Heads small*, scarcely rounded below. *Phyllaries* incumbent in bud, *dark green, broad, lanceolate-subulate*,

mostly subacute, *effloccose* or sparingly floccose below, *with scattered*, dark, unequal *pilose hairs* and occasionally *a few minute glandular hairs*. Ligules glabrous-tipped. Styles yellowish or light livid. Margins of receptacle-pits shortly dentate. Achenes blackish, about 3 mm. long.

This plant was originally described by Lindeberg in 1872 as a variety of *H. caesium* Fr., to which it is evidently allied, on a set of *exsiccatæ* issued as Hier. Scand. Exsicc. no. 64. Six years later a second set of *exsiccatæ* (no. 128) was sent out by Lindeberg as *H. angustatum* var. *clatum*, the specimens being distinctly taller than those of no. 64. The two sets appear to have been collected in the same district in Norway (Bergen), and Lindeberg points out on his second label that no. 64 is a form of rocks and dry places, and no. 128 one of damp grassland. The variety *clatum* thus seems to be really a form only.

H. angustatum is a rare plant in Britain and no entirely typical examples have been seen. It was first collected in the English Lake District, and subsequently in Wales and the Cairngorms. The Taffechan plant seems to be the most characteristic, except for the strong ciliation of the radical leaves. The Cumberland and some Scottish specimens might be referred to var. *clatum*, if that were admitted as a good variety, and those from Ben Hope (Linton no. 151) differ essentially in their glandular peduncles and phyllaries. Plants collected at Dalnaspidal by Røffey in 1914 and named '*H. angustatum*' apparently belong to *H. vulgatum* Fr. though they bear a strong superficial resemblance to *H. angustatum*.

Distribution.—42. Brecon : Taffechan (Shoolbred). 69. Westmorland : Dolly-waggon Pikes (Fox). Helvellyn (Murray). 70. Cumberland : Ennerdale (Addison). 90. Forfar : Unich Water (Linton). 92. S. Aberdeen : Little Craigindal (Linton).

General Distribution.—Scandinavia.

127. *HIERACIUM RHOMBOIDES* (Stenström) Johansson in Arkiv. Bot. Stockholm, xxxi. A. no. 15, 85 (1928) ; *H. gravestellum* var. *rhomboides* Stenstr. Värml. Archier. 38 (1889) ; Hanb. in Journ. Bot. xxxii. 230 (1894) ; *H. caesium* var. *rhomboides* W. R. Lint. Brit. Hier. 59 (1905) ? *H. subramosum* subsp. *gravestellum* var. *rhomboides* Zahn, l. c. 460 (1921).

Exsicc.—Dahlst. H. Exs. ii. 88 and 89 ; Linton, Unich Water, 1889 ; Linton no. 114 (Unich Water) ; Salmon, Teesdale, 1892 ; all in Hb. Mus. Brit.

Stem 25–35 (–50, cult.) cm. high, slender, nearly glabrous, with a few pilose hairs, chiefly below, and somewhat floccose above. *Radical leaves* few, not spreading, *glaucescent* ; the primordial, if produced, oblong, obtuse-mucronate, remotely denticulate and abruptly narrowed below ; the later *oblong to lanceolate* or elliptic-lanceolate, obtuse-mucronate to acute, distantly *denticulate* or the inner with a few fine, sharp teeth, *cuneate-based* ; stem-leaves 1–2, the lower lanceolate, acuminate, with a few sharp, spreading teeth, shortly petioled, the upper smaller and narrower, sessile ; all *clothed with pilose hairs* on both surfaces, the margins ciliate and the long petioles villous. *Inflorescence compactly furcate-corymbose*, with short branches (occasionally a longer lower branch), 2–7 (–12, cult.)-headed, the peduncles and very short acladium (sometimes geminate) flocculose, with scattered fine glandular and occasional pilose hairs. *Heads rather small*, rounded below. *Phyllaries* incumbent in bud, *dark green* (the inner paler), linear-lanceolate, subacute, *sparingly floccose*, *with fine, dark glandular and pilose hairs intermixed*. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3 mm. long.

This plant is allied to *H. caesium* var. *alpestre* Lindbg., which was made a sub-species *gravestellum* of *H. murorum* (L.) Alm. by Dahlstedt. Lindeberg's plant

(Lindbg. H. Sc. ii. 61 and iii. 126) is a small, slender form with a contracted panicle of small, often geminate heads. *H. rhomboides* was first distinguished by Stenström as a variety of *H. gravestellum*, and the above-cited Scandinavian exsiccatae show it to be a somewhat similar plant having a larger though compact inflorescence with the heads more glandular and the terminal less geminate. These exsiccatae closely match the British specimens from the Unich Water and from Teesdale.

The material sent out by Linton under no. 114 is a mixture, the Killin examples being clearly different from the Unich Water form, with large, dark, fairly glandular heads on long peduncles. This discrepancy was noticed by Williams (l. c. 120).

No British specimens have been seen that are referable to typical *H. gravestellum* Dahlst. (*H. caesium* var. *alpestre* Lindbg.). Linton's material from Corrie Ardran under this name is apparently related to *H. submurorum* Lindbg.

Distribution.—65. N.W. Yorks: Upper Teesdale (Salmon). 90. Forfar: Unich Water (Linton).

General Distribution.—Sweden.

128. *HIERACIUM MELANOCHLORICEPHALUM* Pugsley in Journ. Bot. lxxix. 195 (1941).

Exsicc.—Hanbury, Cairntoul, 1887 (type); in Hb. Hanbury, under *H. caesium*.

Caulis 20–45 cm., gracilis, fere glaber, basin anthelamque versus parcissime pilosus et superne leviter floccosus. *Folia radicalia* pauca, *caesia*, plurima *ovalia* ad *lanceolata*, obtuso-mucronulata ad *acuta*, *dentibus* *patulis* *irregulariter* *sinuato-dentata* vel raro *denticulata*, *basi* *cuneata*; *caulinum* *vulgo* *unicum*, lanceolatum, acuminatum, argute serratum vel laciniatum, ±petiolatum, rarius minus, angustius, vix dentatum; omnia utrinque *glabrescentia* vel parce pilosa, marginibus breviter ciliatis petiolisque (nonnunquam longis) pilosis. *Anthela compacta*, *furcato-corymbosa*, acladio brevi ramisque suberectis, 2–6-cephala, pedunculis parce flocculosis pilis obscuris glandulisque sparsis obsitis. *Involucra mediocria*, breviuscula, inferne rotundata. *Squamae* in gemmis incumbentes, *melanochlorae*, latiusculae, linearilanceolatae, plurimae obtusae, *basin versus* ±*floccosae*, senescentes, *pilis obscuris glandulisque brevioribus numerosis vestitae*. Ligulae apice glabrae. Styli lividi. Alveoli receptaculi margine ±dentati.

Stem 20–45 cm. high, slender, nearly glabrous, with a very few pilose hairs about the base and near the inflorescence, where it becomes also slightly floccose. *Radical leaves* few, *caesious* or *pale greyish green*; the primordial broadly oval, rounded-obtuse-submucronulate, remotely sinuate-dentate, shortly narrowed below; the later *oval to lanceolate*, obtuse-mucronulate to acute, *irregularly sinuate-dentate with spreading teeth* or rarely only denticulate, *cuneate-based*; *stem-leaf usually* 1, lanceolate, acuminate, sharply serrate or lacinate, ±petiolate, rarely smaller, narrower and less toothed; all *glabrescent* or sparingly pilose on both surfaces, with shortly ciliate margins and pilose (sometimes long) petioles. *Inflorescence compactly furcato-corymbose*, 2–6-headed, with short acladium and suberect branches, the peduncles sparingly flocculose, with a few scattered dark pilose or glandular hairs. *Heads of medium size*, rather short, rounded below. *Phyllaries* incumbent in bud, *blackish green*, rather broad, linear-lanceolate, mostly obtuse, ±*floccose about the base*, senescent, *with numerous dark pilose and shorter glandular hairs intermixed*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits ±dentate. Achenes reddish black, 3–3.25 mm. long.

This is one of the most distinct of the British forms allied to *H. caesium* and *H. rhomboides*. Its foliage is conspicuously Caesian, but its involucres are very dark with broad and nearly effloccose phyllaries, giving it the aspect of a hybrid between *H. caesium* and some form of the *Alpina Nigrescentia*. Lindeberg remarked on specimens sent to him '*H. caesium* verum quamvis a planta Scandinavica in nonnullis

diversum; involucre fuscior minus floccoso'. Elfstrand named the plant '*H. caesium* var.', and Backhouse, who possessed a specimen, wrote respecting it 'They may be forms of *H. caesium* but are possibly forms of *H. nigrescens*. I strongly suspect that they are forms of *H. vulgatum*'. This offers a wide field for selection!

H. melanochloricephalum has been collected only on Cairntoul, where Hanbury secured a fine set of specimens.

Distribution.—92. S. Aberdeen: Cairntoul (Hanbury).

Endemic.

129. *HIERACIUM STENOPHYTES* W. R. Linton in Journ. Bot. xxxi. 181 (1893); Hanb. in Bab. Man. ed. 9, 259 (1904); *H. euprepes* var. *stenophytes* Williams, l. c. 149 (1902); *H. duplicatum* var. *stenophytes* W. R. Lint. Brit. Hier. 61 (1905).

Exsicc.—Linton, Black's Hope, Moffat, 1890, and cult. 1892; Linton no. 149 (Black's Hope); Marshall no. 3151; all in Hb. Mus. Brit.

Stem 30–50 cm. high, rather slender, sparingly pilose about the base, nearly glabrous above. *Radical leaves* spreading, dull green; the primordial small, broadly oval, rounded-obtuse-mucronate, distantly denticulate, abruptly narrowed below; the later *oblong to lanceolate*, obtuse-mucronate to acute, *sinuate-dentate* with unequal, broad, spreading, apiculate teeth, ± abruptly narrowed below to long, slender petioles; *stem-leaves generally* 2, the lower lanceolate, acuminate, with sharp, patent teeth, petiolate, the upper similar, but smaller and sessile; all clothed with scattered pilose hairs on both surfaces and on margins, with the petioles more densely hirsute. *Inflorescence* furcate-corymbose, 4–8(–30, cult.)-headed, with straight, suberect branches exceeding the accladium, the peduncles floccose with scattered pilose and sometimes some fine glandular hairs. *Heads of medium size*, rather narrow, rounded below. *Phyllaries* (porrect) in bud, blackish green with the inner paler, broad, linear-lanceolate, mostly obtuse, floccose only towards the base, with dark pilose and fewer, shorter glandular hairs. Ligules glabrous-tipped. Styles yellowish. Margins of receptacle-pits (dentate-fimbriate). Achenes blackish, about 3.5 mm. long.

H. stenophytes, originally described as a species by W. R. Linton, was subsequently reduced by him to a variety of *H. duplicatum* Almq. It appears to differ essentially from *H. duplicatum* in its sinuate-dentate rather than deeply serrate foliage and its very much larger heads, those of *H. duplicatum* being small and narrow, the terminal often more or less geminate and so recalling the inflorescence of *H. euprepes* or *H. orcadense*. *H. stenophytes* also bears some resemblance to *H. longilobum* Dahlst., which differs substantially, however, in the strongly glandular clothing of its heads. As indicated under *H. longilobum*, Linton's set no. 149 is a mixture of that species from the Midlaw Burn with *H. stenophytes* from Black's Hope.

This plant has been collected in one station only, Black's Hope, near Moffat.

Distribution.—72. Dumfries: Moffat (Linton).

Endemic.

130. *HIERACIUM VENNICONTIUM* Pugsley in Journ. Bot. lxxix. 196 (1941).

H. euprepes var. *glabratum* Lint. in Journ. Bot. xxxi. 181 (1893); Hanb. in Bab. Man. ed. 9, 254 (1904); W. R. Lint. Brit. Hier. 57 (1905); *H. sagittatum* subsp. *euprepes* var. *glabratum* Zahn, l. c. 348 (1921); non *H. glabratum* Hoppe ex Willd. Sp. Pl. iii. 1562 (1800).

Exsicc.—Linton no. 19 (Clova and Killin); Linton, Glen Dole, 1890 (type), and Lochan-na-Lairige, 1891; all in Hb. Mus. Brit.; Hanbury, Cairntoul, 1886, and Almond, 1888, in Hb. Hanbury.

Stem 25–60 cm. high, striate, \pm pilose towards the base, slightly floccose upwards with scattered fine, dark-based pilose hairs. *Radical leaves* usually few, *yellowish or bright green*; the primordial (when produced) small, oblong, obtuse-mucronate, *lenticulate to sinuate-serrate*, shortly cuneate-based; the later (often large) *oblong to lanceolate*, obtuse-mucronate to acute, *subentire to sharply serrate*, often with coarse, spreading teeth, *cuneate-based*; *stem-leaves* 1–2(–3), the lower lanceolate or ovate-lanceolate, acuminate, generally sharply serrate, \pm petiolate, the upper small, often linear and bractlike; all *glabrescent* or with a few scattered pilose hairs on both surfaces, with ciliate margins and \pm pilose petioles. *Inflorescence* *laxly furcate-corymbose*, 2–12(–many, cult.)-headed, the branches exceeding the very short (and sometimes geminate) acladium, with occasionally a long branch from the axil of the lower stem-leaf, the peduncles floccose with scattered or \pm numerous fine, dark pilose and glandular hairs. *Heads of medium size* (more rarely small), *rather narrow* (cylindric) but subtruncate-based. *Phyllaries* incumbent in bud, not numerous, *blackish green* (the inner paler), *broad*, linear-oblong, mostly *obtuse*, sparingly floccose about the base, slightly senescent, *with \pm numerous dark pilose and shorter glandular hairs* and microglands. Ligules glabrous- or slightly pilose-tipped. Styles yellow to fuscous. Margins of receptacle-pits subulate-dentate. Achenes blackish, 3.5–4 mm. long.

This plant has been hitherto treated as a variety of *H. euprepes* Hanb., but its foliage is very different, more glabrous and more toothed with longer petioles, its inflorescence is furcate and laxer, although the geminate acladium sometimes appears, and its heads are darker (of a velvety texture) and more glandular. Moreover, the receptacle-pits are subulate-dentate and show no trace of the fimbriation that characterizes *H. euprepes*. The plant is therefore treated as a separate species, *H. vennicontium*, the name being taken from the Vennicontes, a Celtic tribe once inhabiting Perth and Forfar, where the hawkweed grows.

H. vennicontium seems most closely allied to *H. duplicatum* Almq. ex Dahlst., from which it differs by its broader, coarser and less toothed foliage, and its normally larger and less pilose heads. The specimen in Herb. Hanbury from Kincaigie Burn, Perth, referred to *H. duplicatum* by Elfstrand and described on page 60 of W. R. Linton's 'British Hieracia', is a small-headed form of *H. vennicontium* and not identical with Dahlstedt's authentic material Hier. Exs. ii. 84 (1889).

Distribution.—64. M.W. Yorks: Ribblesdale (Ley). 88. Mid Perth: Ben Lawers! Almond (Hanbury). Killin (Linton). Meal Ghaordie (Groves). 89. E. Perth: Glen Shee (Marshall). 90. Forfar: Canlochen! Clova! 92. S. Aberdeen: Glen Callater (Syme). Cairntoul (Hanbury). Braemar! 94. Banff: Ailnack (Roffey). 96. E. Inverness: Cluny Castle (Marshall). 97. W. Inverness: Coire Coille (Shoolbred). Glen Spean! 98. Argyll: Kingshouse and Ben Chaisteil (Marshall). 110. Outer Hebrides: Tarbert (Shoolbred).

Ireland.—38. Down: Mourne Mts. (Stewart and Praeger).

Endemic.

131. *HIERACIUM ANFRACTIFORME* E. S. Marshall in Journ. Bot. xxx. 18 (1892); Williams, l. c. 151 (1902); W. R. Lint. Brit. Hier. 61 (1905); *H. subanfractum* Marshall in Journ. Bot. xxx. 183 (1892); Hanb. in Bab. Man. ed. 9, 259 (1904); *H. caesium* subsp. *neo-Marshallianum* Zahn, l. c. 447 (1921).

Exsicc.—Marshall, Kingshouse, 1893; nos. 3524 and 4008; Linton, Corrie Ardran, 1891; Linton no. 41 (Fersit Forest and Corrie Ardran); all in Hb. Mus. Brit.

Stem 20–50 cm. high, glabrate or slightly pilose below, sparingly floccose above. *Radical leaves* few, suberect, *bright green*; the primordial obovate-lanceolate, obtuse-mucronate, with fine, ascending teeth, cuneate-based; the later *lanceolate to linear-lanceolate*, acute, *with large, acute, cusped teeth* increasing in size downwards and

sometimes decurrent on the (frequently long) petioles, *narrowly cuneate-based*; *stem-leaf usually 1*, linear-lanceolate, incise-dentate, \pm petiolate; all *glabrescent above* and with scattered pilose hairs beneath, especially about the midrib, margins ciliate and petioles \pm villous. *Inflorescence furcate-corymbose*, sometimes with a long lower branch, 1-8(-12, cult.)-headed, with straight, suberect peduncles, which are floccose with numerous dark glandular and pilose hairs. *Heads of medium size*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-oblong, *obtuse*, slightly floccose, chiefly towards the base and on the margins, senescent, *with numerous dark pilose and a few shorter glandular hairs*. *Ligules normally slightly pilose-tipped*. Styles livid. Margins of receptacle-pits shortly dentate. Achenes dark reddish brown, about 4 mm. long.

H. anfractiforme is a strongly marked and fairly uniform species, characterized by long, narrow leaves with large, cusped teeth, and very dark heads. It seems confined to the south-west Highlands of Scotland.

Zahn re-names the plant *H. neo-Marshallianum* on the ground that *H. anfractiforme* Marshall is antedated by *H. anfractiforme* Almq. As pointed out by Williams (l. c.) although Almquist described *H. silvaticum* var. *anfractiforme* and Dahlstedt issued a set of exsiccatae as *H. silvaticum* **anfractiforme* prior to the publication of Marshall's species, yet the Scandinavian plant was not described as a species, *H. anfractiforme*, until 1893 (Dahlst. Bidrag, ii. 108) and is thus antedated by Marshall's plant.

Distribution.—88. Mid Perth: Ben Laoigh (Buchanan-White). Killin and Corrie Ardran (Linton). 97. W. Inverness: Fersit Forest (Linton). 98. Argyll: Kings-house, Ben Creachain and Dalmally (Marshall). 99. Dumbarton: Ben Voirlich (Marshall).

Endemic.

Series **Dissimilia**. (See page 170.)

132. *HIERACIUM CAESIOMURORUM* Lindeberg, Hier. Scand. Exsicc. ii. 59 (1872); Dahlst. Bidrag, iii. 6 and 44 (1894); Hanb. in Bab. Man. ed. 9, 256 (1904); W. R. Lint. Brit. Hier. 60 (1905); *H. caesium* subsp. *caesiomurorum* Zahn, l. c. 451 (1921).

Icones.—Zahn, l. c. fig. 32. Pl. 8, fig. a.

Exsicc.—Lindbg. H. Sc. ii. 59; Dahlst. H. Exs. i. 64, 65 and 66; Linton, Braemar. 1889; Linton no. 21 (Braemar); Marshall, Ben Loyal and Glen Shee; all in Hb. Mus. Brit.

Stem 30-80 cm. high, usually slender, striate, reddish below, glabrescent or slightly pilose (chiefly about the base), \pm floccose above. *Radical leaves* few, thin, *bright green or \pm glaucouscent*; the primordial, if developed, oblong, rounded-obtusely-mucronulate, denticulate, cuneate-based; the later (often large) *oblong-lanceolate* to lanceolate, acute to acuminate, sinuate-dentate above, becoming generally deeply *incise-dentate* with long, spreading teeth towards the *abruptly narrowed or sagittate base*; *stem-leaves* (0-)1-2(-3), the lowest lanceolate or linear-lanceolate, acuminate, often incise-dentate with long, spreading teeth, \pm petiolate, the upper smaller, narrower and sessile; all \pm clothed with pilose hairs on the margins and both surfaces but often *glabrescent above*, the underside of the stem-leaves also \pm floccose and the long petioles \pm villous. *Inflorescence racemose-corymbose*, 2-8(-15)-headed, with \pm long, straight, suberect branches exceeding the accladium, the peduncles densely floccose with spreading pilose and fine glandular hairs. *Heads rather large*, rounded below. *Phyllaries* incumbent in bud, *greyish or olive green*, linear-lanceolate, mostly obtuse, *floccose*, especially on the margins, *strongly senescent*, and *densely clothed with pilose hairs with some shorter glandular hairs intermixed*. *Ligules slightly pilose-tipped*. Styles yellowish. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

In his original brief description of this plant Lindeberg suggests for it a hybrid origin, viz. *H. caesium* × *murorum*, presumably because at that time its characters seemed to him intermediate between those of these two species. There appears to be no special ground for this suggestion in the case of *H. caesiummurorum* more than in the great majority of recognized species of the genus. *H. caesiummurorum* is a well marked and fairly uniform hawkweed in the Scottish Highlands and is generally distributed in the Braemar district. There is a close resemblance between Scottish specimens and some of the Scandinavian exsiccatæ. Linton no. 21, as sent out, is partly a cultivated plant (orig. Glen Lochay), which is very untypical.

Distribution.—42. Brecon : Dyffryn Crawnnon (Hanbury). 88. Mid Perth : Glen Lochay (Linton). Meal Ghaordie (Groves). Glen Lyon (Marshall). 89. E. Perth : Glen Shee (Marshall). Stobhall (Buchanan-White). 92. S. Aberdeen : Braemar ! 94. Banff : Tomintoul (Shoolbred). 95. Elgin : Dumphail (Marshall). 96. E. Inverness : Kingussie (Roffey). 97. W. Inverness : Glen Roy ! 104. N. Ebudes : Rhum (W. A. Clark). 108. W. Sutherland : Tongue and Ben Loyal (Marshall). Inchnadamph (Salmon). 110. Outer Hebrides : S. Uist (Heslop Harrison).

General Distribution.—Scandinavia.

133. *HIERACIUM DISSIMILE* Lindeberg ex Elfstrand, Hier. Alp. Mit. Skand. 60 (1893) ; Hanb. in Bab. Man. ed. 9, 257 (1904) ; W. R. Lint. Brit. Hier. 62 (1905) ; *H. murorum* var. *dissimile* Lindbg. Hier. Scand. Exsicc. iii. 121 (1878) ; *H. caesium* subsp. *dissimile* Zahn, l. c. 446 (1921).

Exsicc.—Lindbg. H. Sc. iii. 121.

Stem 20–40 cm. high, slender and from a slender rootstock, sometimes purplish towards the base, pilose below, becoming floccose upwards. *Radical leaves* few, suberect, *bright green* ; the primordial, when developed, oval, obtuse-mucronate, sharply serrate, cuneate-based ; the later *ovate-lanceolate* to linear-lanceolate, very acute, *with sharp, unequal* (often large), *spreading or cusped teeth*, which are sometimes decurrent along the petiole, generally *attenuate below* ; *stem-leaves* 1–3, the lowest lanceolate, acute, with irregular, long, cusped teeth, petiolate, the upper ± bractlike ; all *with scattered pilose hairs on both surfaces* and on the margins, the petioles more densely pilose and the underside of the cauline leaves also ± floccose. *Inflorescence* *furcate-corymbose*, 1–6-headed, with straight peduncles, which are floccose with numerous dark glandular hairs. *Heads* *rather small*, rounded below. *Phyllaries* incumbent in bud, *dark green*, linear-oblong, subacute, ± floccose, *with many dark-based pilose hairs, scarcely glandular*. *Ligules* *pilose-tipped*. Styles fuscous. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3.5 mm. long.

β. *majus* var. nov.

Exsicc.—Linton no. 94 (Killin (type) and Glen Lochay) ; Marshall nos. 3005 and 3867 ; all in Hb. Mus. Brit.

Herba altior (ad 50 cm.) et robustior. Folia caulina vulgo 1–2, inferior tantum bene evolutum, valde dentatum, petiolatum. Anthela 2–10-cephala ; *involucra majuscula* ; squamae satis latae, inferne praesertim in marginibus floccosae, inter pilos glandulis obscuris nonnullis immixtis. *Ligulae apice glabrae*. Aliter ut in typo.

Taller and more robust, with stem 20–50 cm. high. Stem-leaves usually 1–2, the lower only developed, deeply toothed and petiolate. Inflorescence 2–10-headed ; *heads rather large* ; the phyllaries rather broad, floccose chiefly on the margins below, with some dark glandular mixed with the pilose hairs. *Ligules glabrous-tipped*. Otherwise like the type.

The prevailing British form of this species is that now described as var. *majus*, but a plant collected by Shoolbred at Melness, in Sutherland, in 1897, a form found by Corstorphine at Canlochen in 1916, and another obtained by Marshall on Ben Laoigh (no. 201) approach the typical form.

A variety *poliaenum* Dahlst. was reported by Hanbury from Caithness and Inverness (Journ. Bot. xxxii. 230 (1894)) and is included in Babington's Manual (l. c.). There is an authentic example of this plant in Herb. Mus. Brit. (Dahlst. H. Exs. iv. 72), which has similar foliage to typical *H. dissimile*, but densely floccose peduncles and heads, both almost epilose and eglandular. The British material so named does not agree with this var. *poliaenum*. The Caithness (Wick) example in Herb. Hanbury is not a *dissimile* form, and the Inverness (Kingussie) specimen is doubtfully separable from var. *majus*. Another set, Marshall no. 4313, from Crathie, in East Inverness, differs essentially from var. *poliaenum* by its peduncles and heads having numerous dark glandular and pilose hairs, with leaves less deeply serrate than any other material of *H. dissimile* that has been observed.

Another variety of *H. dissimile* (var. *porrigens* Almq.) was added to the British list in 1894 by Hanbury (Journ. Bot. xxxii. 230), the specimens so named having been collected at Countisbury, in North Devon. The name reappears in Babington's Manual, ed. 9, p. 258, and in W. R. Linton's 'British Hieracia' (p. 62) the plant is shown as a species, *H. porrigens* Almq., with a second habitat added, Cefn Fedw, in Denbigh.

Almquist's plant (*H. murorum* subsp. *porrigens*) is described by Dahlstedt (Bidrag, iii. 6 and 48 (1894)) and is represented in Herb. Mus. Brit. by two sheets, Dahlst. H. Exs. i. 67 and 68. These specimens closely resemble *H. caesiomurorum*, with which *H. porrigens* is associated both by Dahlstedt and by Zahn. The habit and foliage, with one large stem-leaf, are somewhat similar, and the heads are of medium size or rather large, with obtuse, floccose and fairly glandular phyllaries.

There is a specimen in Herb. Hanbury referred to var. *porrigens* which was collected at Countisbury by Hiern in 1889. The name seems to have been originally suggested by Elfstrand. Its inflorescence is indifferent, but it shows four cauline leaves, the uppermost ovate-lanceolate and toothed, and appears to be a glabrate shade-form of *H. Lachenalii* Gmelin, of the Subsection *Eu-Vulgata*. There is also a cultivated specimen of the original Countisbury plant in Herb. Barton (ex hort. Hanbury, 1895), received from Miss R. F. Thompson. This shows nine stem-leaves and many small heads, and seems likewise to be a form of *H. Lachenalii*. Both *H. Lachenalii* and *H. anglorum* (Ley) Pugsl. grow in the East Lyn valley, and examples of each have been seen in herbaria labelled '*H. porrigens*'. No Devon specimen has been seen agreeing with the Scandinavian plant.

Of the Cefn Fedw plant there are cultivated examples in Herb. Mus. Brit. (Ley, 1904 and 1908) which are clearly different both from the Devon form and from var. *porrigens* (Almq.). They possess oblanceolate, subentire, obtuse root-leaves and two stem-leaves, and are glabrescent throughout, with panicles of rather dark heads. They seem to belong to Zahn's grex *irriguum* of the *Eu-Vulgata* and to be allied to *H. lepidulum* Stenstr.

An unnamed example in Herb. Mus. Brit., collected in 1898 by Linton at Roromore, Glen Lyon, in Perthshire, is much more like var. *porrigens*, and has densely floccose and glandular heads and peduncles, but the material is insufficient to warrant a certain determination.

Distribution.—88. Mid Perth : Ben Laoigh (Marshall). 90. Forfar : Canlochen (Corstorphine). 108. W. Sutherland : Melness (Shoolbred).

var. *majus*.

88. Mid Perth : Killin, Glen Lochay and Ben Lawers (Linton). Fortingal (Marshall). Ben Chonzie (Miller). 89. E. Perth : Glen Shee and Glen Beg (Marshall). 92. S. Aberdeen : Glen Ey (Shoolbred). 96. E. Inverness : Kingussie (Hanbury)

General Distribution (of the species).—Scandinavia, .

134. *HIERACIUM SUBRAMOSUM* Lönnroth, Resa Smål. Goth. 86, in Öfvers. Sv. Vet. Akad. Förh. n. 4 (1882) ; Dahlst. Bidrag, iii. 102 (1894) ; Hanb. in Journ. Bot. xxxii. 230 (1894) ; in Bab. Man. ed. 9, 260 (1904) ; Williams, l. c. 160 (1902) ; W. R. Lint. Brit. Hier. 66 (1905) ; *H. subramosum* subsp. *subramosum* Zahn, l. c. 458 (1921).

Exsicc.—Boswell-Syme, Burntisland to Pettycur, 1876, as *H. pallidum*, in Hb. Mus. Brit. ; Dahlst. H. Sc. xviii. 60, in Hb. Kew.

Stem 40–70 cm. high, robust, pilose chiefly towards the base, becoming also floccose above. *Radical leaves* few, subsimilar, yellowish green, oblong to lanceolate, obtuse-mucronate to acute, denticulate or with a few distant, coarse teeth towards the cuneate base, the teeth sometimes decurrent on the petiole ; *stem-leaves* 2–4(–5), decreasing upwards, all sessile or nearly so, lanceolate, acute, denticulate with \pm coarse, spreading teeth towards the narrowed base ; all pilose on both surfaces with coarse hairs or glabrescent above, the margins densely ciliate and the petioles (of varying length) villous. *Inflorescence* laxly paniculate-corymbose, sometimes with long lower branches from the axils of the cauline leaves, 5–10-headed, the peduncles bracteolate with linear bracteoles, densely floccose, and with scattered, spreading pilose hairs. *Heads* of medium size, rounded-based. *Phyllaries* in bud, dark green with paler margins, linear-lanceolate, subacute, floccose (chiefly below), with numerous dark pilose and a few minute glandular hairs intermixed. *Inner ligules* pilose-tipped. *Styles* livid. *Margins* of receptacle-pits incise-dentate. *Achenes* blackish, about 3.5 mm. long.

The inclusion of *H. subramosum* in the British list depends on the identification of specimens collected by Boswell-Syme in 1876 on the coast between Burntisland and Pettycur, in Fifeshire. These were named '*H. subramosum* Lönnr.' by Elfstrand for Hanbury. In 1907 W. R. Linton and Marshall visited the district and obtained further material (Marshall no. 3152) of what they thought at the time to be the same plant. E. F. Linton, however, pointed out that these later specimens were different from Boswell-Syme's gathering and near *H. vulgatum* Fr., under which they are properly placed. The original Fifeshire plant, which is perhaps now extinct, seems to differ somewhat from the Scandinavian *H. subramosum* in its broader and darker phyllaries.

Zahn refers the exsiccata Linton no. 113 (as *H. caesium*) to *H. subramosum* (the specimens from Meal Garbh to a variety *plicatifforme* Dahlst.) but the material examined (from Ben Loyal) closely resembles *H. farrense* Hanb. and does not match the Fife plant or agree with the descriptions of Lönnroth and Dahlstedt.

Distribution.—85. Fife : Pettycur (Boswell-Syme).

General Distribution.—South Scandinavia.

135. *HIERACTIUM ORARIUM* Lindeberg, Hier. Sc. Exsicc. ii. 85, and in Bot. Not. 121 (1872) ; Williams, l. c. 149 (1902) ; Hanb. in Bab. Man. ed. 9, 257 (1904) ; W. R. Lint. Brit. Hier. 65 (1905), partim ; *H. subramosum* subsp. *orarium* Zahn, l. c. 467 (1921).

Exsicc.—Lindbg. Hier. Sc. ii. 85 ; Shoolbred, Tarbert, 1894, in Hb. Hanbury.

Stem 30–60 cm. high, \pm slender, striate, somewhat reddish below, pilose with spreading hairs (which are black-based in the upper part of the stem), also slightly floccose upwards. *Radical leaves* not numerous, bright green ; the primordial, when produced, oval, obtuse-mucronate, denticulate, with rounded base ; the later oblong to lanceolate, obtuse-mucronate to acute, denticulate to irregularly serrate-dentate with sharp, ascending teeth, attenuate below to a cuneate base ; *stem-leaves* 2–3(–5), the lowest shortly petioled and resembling the inner basal, the upper lanceolate and sessile, all \pm sharply and irregularly toothed ; all \pm glabrescent above, pilose, especially on the midrib, and rarely also floccose beneath, margins ciliate and petioles \pm villous,

Inflorescence paniculate-corymbose, with short acladium and sometimes long lower branches, (2-)3-18-headed, the peduncles floccose with many fine, spreading pilose hairs, nearly eglandular. *Heads of medium size, rather broad, rounded below. Phyllaries* incumbent in bud, *dark olive green*, rather broad, linear-lanceolate, obtuse, sparingly floccose, *with dense, long, dark-based pilose hairs, often almost eglandular. Ligules* (especially the inner) *pilose-tipped*. Styles livid. Margins of receptacle-pits denticulate-dentate ap. W. R. Linton. Achenes reddish black, 3.5-4 mm. long.

β. scopulorum var. nov.

Exsicc.—Stewart, Cranfield, Lough Neagh, Antrim, 1897 (type), in Hb. Mus. Brit.

Caulis minus pilosus ; folia utrinque pilosa. Involucra satis parva ; ligulae apice glabrae.

Stem less pilose ; leaves pilose on both surfaces. Heads rather small ; ligules glabrous-tipped. Otherwise like the type.

H. orarium is allied to *H. dissimile*, but differs in its less deeply cut foliage, with normally a greater development of the cauline leaves ; also in its more pilose and nearly eglandular peduncles, and its long-pilose phyllaries.

The specimens from New Brighton, Cheshire, bear only two stem-leaves but seem otherwise normal ; those from Sellack, Hereford, referred to this species, do not appear to belong here. Shoolbred's examples from Waulkmill Bay, Orkney, partially resemble typical *H. orarium* but have larger, less pilose and fairly glandular heads. *H. orarium* has recently been obtained in several localities in the Outer Hebrides.

Distribution.—58. Cheshire : New Brighton (Purchas). 64. M.W. Yorks : Ingleborough (R. F. Thompson). 66. Durham : Langdon Beck (Martindale). 110. Outer Hebrides : Tarbert, S. Harris (Shoolbred).

var. *scopulorum*.

Ireland.—39. Antrim : Lough Neagh (Stewart).

General Distribution.—Scandinavia.

136. *HIERACIUM CRAVONIENSE* (F. J. Hanbury) Roffey in Lond. Cat. ed. II (1925).

H. duriceps var. *cravoniense* Hanb. in Journ. Bot. xxxii. 230 (1894) ; in Bab. Man. ed. 9, 257 (1904) ; Williams l. c. 158 (1902) ; W. R. Lint. Brit. Hier. 63 (1905) ; *H. caesium* subsp. *cravoniense* Zahn, l. c. 440 (1921).

Exsicc.—Linton no. 180 (Chapel-le-Dale) ; Ley, Ingleton, 1902, and Ribbleshead, 1903 ; W. R. Linton, Arncliffe, 1904, and Beattock, 1907 ; all in Hb. Mus. Brit.

Stem 25-60 cm. high, \pm slender and flexuous, pilose (especially below) and \pm floccose above. *Radical leaves pale green* ; the primordial oval, rounded-obtusely-mucronate, denticulate, shortly cuneate-based ; the later \pm narrowly oblong to lanceolate, obtuse-mucronate to acute, *denticulate*, becoming irregularly and sometimes deeply *sinuate-dentate towards the base, attenuate below* to \pm short, winged petioles ; *stem-leaves* 2-4, decreasing upwards, \pm serrate-dentate, especially below, the lowest subpetiolate ; all *pilose* on both sides *with subsetiform hairs*, with strongly ciliate margins and villous petioles. *Inflorescence* \pm *furcate-corymbose*, often lax, 3-15(-25)-headed, with long, slender branches often much exceeding the very short acladium (occasionally branching from the base), the *terminal heads* frequently appearing *geminute* through the shortening of the uppermost lateral peduncles, the peduncles densely floccose, with numerous long, spreading pilose hairs. *Heads small, usually stylose-flowered. Phyllaries* incumbent in bud, *dark olive-green*, rather broad, linear-lanceolate, mostly obtuse, floccose and slightly senescent, *densely clothed with very long, pale pilose hairs, almost eglandular*. Styles livid. Margins of receptacle-pits shortly dentate, Achenes reddish black, 3-3.5 mm. long.

β. pseudo-duriceps var. nov.

H. duriceps W. R. Linton, Brit. Hier. 62 (1905), non Hanbury; *H. bifidum* subsp. *duriceps* Zahn, l. c. 419 (1921).

Exsicc.—Linton no. 144 (Bettyhill) (type); Marshall no. 4098; Marshall, Rachills, Moffat, 1907; Roffey, Coniston and Tilberthwaite Gyll, 1910; all in Hb. Mus. Brit. as *H. duriceps*.

Folia quam typi paulo angustiora. Pedunculi interdum parce pilosi, vulgo glandulosi. Involucra minima, flosculis saepe haud stylosis. Squamae quam in typo angustiores, sparsius et brevius pilosae, saepius glandulis tenuibus brevibus vestitae. Ligulae apice glabrae vel pilosae.

Leaves rather narrower than in the type. Peduncles sometimes only sparingly pilose, usually with some glandular hairs intermixed. Heads very small, often not stylose-flowered. Phyllaries narrower than in the type, less densely and more shortly pilose, usually with some fine, short glandular hairs intermixed. Ligules glabrous- or pilose-tipped. Otherwise like the type.

As explained under *H. duriceps* Hanb., the gathering (Oykell Bridge) from which Hanbury's original description was drawn up consists of a mixture of two species, which, as represented on the sheets, are superficially similar. The plant to which this description is not applicable was subsequently found at other stations and was treated by W. R. Linton (l. c.) as typical *H. duriceps*. Meanwhile, another somewhat similar plant had been discovered in Yorkshire and described by Hanbury (l. c.) as *H. duriceps* var. *cravoniense*. In the circumstances it seems best, as these plants must be separated from *H. duriceps*, to treat the variety *cravoniense* as the type of a new species, and to make the false *H. duriceps* described by W. R. Linton (l. c.) a variety of it.

H. cravoniense, with its variety, is a very distinct plant owing to its narrow foliage and frequently lax panicle of small, geminate heads. It seems to produce stylose flowers more frequently than any other British hawkweed except *H. ampliatum*. The Frankland Woods plant cited below, of which there is excellent material in Hb. Hanbury, has the peduncles, and especially the phyllaries, densely glandular, and sparingly and irregularly pilose. It was referred to *H. vulgatum* var. *glaucovirens* Dahlst.

Distribution.—60. W. Lanes. : Easegill (Wilson). 64. M.W. Yorks. : Chapel-le-Dale and Ribbleshead (Ley). Ingleton (Cryer). Settle (R. F. Thompson). Arncliffe (Linton). Grassington! 65. N.W. Yorks. : Dent Dale (Oliver). Sedburgh (Wilson). 69. Westmorland : Colwith Force (Roffey). 72. Dumfries : Beattock (Linton). 88. Mid Perth : Almond (Hanbury). 89. E. Perth : Glen Shee (Linton). 90. Forfar : Den of Airlie (Corstorphine). 92. S. Aberdeen : Braemar! (non-stylose). 97. W. Inverness : Loch Laggan (Marshall). 106. E. Ross : Garve (Marshall). 107. E. Sutherland : Oykell Bridge (Hanbury). 110. Outer Hebrides : N. Harris (Wilmott). var. *pseudo-duriceps*.

66. Durham : Frankland Woods (Fox). 69. N. Lanes : Coniston and Tilberthwaite Gyll (Roffey). 72. Dumfries : Rachills, Moffat (Marshall). 108. W. Sutherland : Bettyhill (Linton).

Endemic.

137. *HIERACIUM RUBIGINOSUM* F. J. Hanbury in Journ. Bot. xxxii. 229 (1894); in Bab. Man. ed. 9, 254 (1904); Williams, l. c. 127 (1902); W. R. Lint. Brit. Hier. 49 (1905); *H. sagittatum* subsp. *rubiginosum* Zahn, l. c. 345 (1921); *H. vulgatum* var. *rubescens* Backh. Mon. 61 (1856).

Exsicc.—Backhouse, Giggleswick, 1853, as *H. vulgatum* var. *rubescens*, in Hb. Kew; R. F. Thompson, Feizor, Stainforth and New Hall Glen, 1888, Chapel Beck

Glen, 1891 ; Ley, Moughton Scars, 1902, and Dyffryn Cwannon, cult. 1906 ; Linton no. 91 (orig. Settle, partim) ; all in Hb. Mus. Brit.

Stem 25–70 cm. high, \pm robust, sometimes tinted with red, *pilose throughout* (especially below), \pm floccose with a few scattered glandular hairs above. *Radical leaves dull green*, occasionally tinged with purplish red beneath ; the primordial oblong-obovate to elliptic, obtuse-mucronate, subdenticulate, with shortly cuneate base ; the later *ovate-lanceolate* to oblong, \pm acute or the inner acuminate, *denticulate or with \pm distant, sharp, ascending teeth*, chiefly towards the cuneate or more rarely rounded base ; *stem-leaves* 1–3(–5), the lowest large, ovate-lanceolate, acuminate, with deep irregular teeth in the lower half, subsessile, the upper becoming sessile and decreasing to linear and bractlike ; all \pm *pilose on both surfaces with rough, subsetiform hairs*, the margins ciliate and the rather short petioles villous. *Inflorescence paniculate-corymbose*, generally compact, 2–15-headed, with short, incurved peduncles, which are floccose with dark, spreading pilose and fine glandular hairs, the pilose hairs sometimes predominating, at others the glandular. *Heads rather large*, subtruncate-based. *Phyllaries* connivent in bud ap. W. R. Linton, *dark olive-green, broad, linear-lanceolate*, mostly obtuse, *sparingly floccose, with dense \pm long, dark-based pilose and a few shorter glandular hairs*. *Ligules glabrous-tipped*. *Styles yellow*. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3 mm. long.

β . *peccense* W. R. Linton, Brit. Hier. 49 (1905) ; *H. sagittatum* subsp. *rubiginosum* var. *peccense* Zahn, l. c. 345 (1921).

Exsicc.—W. R. Linton, Tunsley Dale, 1898 and 1903 ; Cave Dale, 1904 ; Linton no. 91 (Litton, as *H. rubiginosum*) ; all in Hb. Mus. Brit.

Leaves pale green, more pilose and more closely and finely toothed than in the type ; stem-leaves \pm petiolate. Phyllaries darker, with pale, floccose margins, fewer pilose and \pm numerous dark glandular hairs. Styles livescent.

γ . *rivulare* var. nov.

Exsicc.—Pugsley, no. 545 (Grassington-type) ; Barden Towers and Bolton Woods, 1919 ; all in Hb. Pugsley ; Cryer, Linton, W. Yorks, in Hb. Mus. Brit.

Folia radicalia pauca, ut in var. *peccense* pallide virentia, valde pilosa, sed ut in typo dentata, saepe petiolis longioribus praedita ; caulina 2–4, infimum subpetiolatum. Pedunculi dense pilosi, floccosi. Involucra pauca, ad 8. Squamae atrovirides, lanceolato-subulatae, acutae, marginibus anguste floccosis et normaliter glandulis brevibus multis pilisque longis densis obtectae. Styli livescentes.

Radical leaves few, pale green, strongly pilose as in var. *peccense* but toothed as in the type, often with longer petioles ; stem-leaves 2–4, the lowest subpetiolate. Peduncles densely pilose and floccose. Heads few (–8). Phyllaries dark green, lanceolate-subulate, acute, with narrow, floccose margins, and normally many short glandular as well as dense, long pilose hairs. Styles livescent.

δ . *glabrescens* var. nov.

Exsicc.—Ley, Craig Dulyn, 1904 (type), in Hb. Mus. Brit.

Caulis gracilis, rubescens, inferne sparsim pilosus. Folia radicalia lanceolata ad oblonga, acuta, argute denticulata, basi cuneata ; caulina 2–3, infimum ovato-lanceolatum, acuminatum, denticulatum, petiolatum ; omnia nisi inferne in costâ dorsali glabra, petiolis parce pilosis. Involucra 2–6, eis typi similia.

Stem slender, reddish, sparingly pilose below. Radical leaves lanceolate to oblong, acute, sharply denticulate, cuneate-based ; stem-leaves 2–3, the lowest ovate-lanceolate, acuminate, denticulate, petiolate ; all glabrous except on the midrib beneath, with sparingly pilose petioles. Heads 2–6, resembling those of the type.

H. rubiginosum, originally distinguished by Backhouse as a variety of *H. vulgatum*,

is a conspicuous hawkweed owing to its roughly hirsute foliage and large heads. It has been confused with *H. Lintonii* Ley, which is of a similarly robust habit of growth but is distinguishable by its single, deeply cut stem-leaf and its less pilose phyllaries. The position of *H. rubiginosum* in the Section *Vulgata* is perhaps debatable, but it appears more nearly allied to such species as *H. proximum* Hanb. and *H. farrense* Hanb. than to those of the Subsection *Sagittata*, where it is placed by Zahn.

In Great Rocks Dale, Derbyshire, a plant with glabrate leaves occurs (coll. W. R. Linton) approaching the Welsh variety *glabrescens*.

Distribution.—42. Brecon : Dyffryn Crawnon (Ley). 64. M.W. Yorks : Giggleswick (Backhouse). Settle and Gordale (Hanbury). Feizor and Chapel-le-Dale (R. F. Thompson). Ingleborough! Moughton and Kettlewell (Ley). Twistleton, Horton and Ribbleshead! (Linton). 66. Durham : Langdon Beck (Mennell). 69. Westmorland : Scout's Scar, Kendal (Linton). 109. Caithness : Lybster (Grant).

var. *peccense*.

57. Derby : Litton, Tunsley Dale and Cave Dale (Linton).

var. *rivulare*.

64. M.W. Yorks : Linton (Cryer). Grassington! Barden Towers! Bolton!

var. *glabrescens*.

49. Carnarvon : Craig Dulyn (Ley).

Endemic.

Series **Eu-Caesia**. (See page 171.)

138. *HIERACIUM CAESIPILOSUM* Pugsley in Journ. Bot. lxxix. 196 (1941).

Exsicc.—Pugsley no. 554 (Teesdale-type), 555 and 556, in Hb. Pugsley; Hume, Upper Teesdale, 1903, in Hb. Mus. Brit.

Caulis 25–45 cm., gracilescens, striatus, pilis pallidis patulis (inferne dense) hirsutus, sursum etiam floccosus. *Folia radicalia* pauca, *caesia*, plurima *ovalilanceolata*, acuta ad cuspidata, *argute sinuato-dentata*, basin \pm *cuneatam* versus *dentibus majoribus* (interdum maximis) in petiolo normaliter brevi nonnunquam decurrentibus; *caulina* 2–3, infimum nunc basalibus intimis simile, nunc latius, breviter petiolatum, ovato-lanceolatum, acuminatum, dentibus paucis maximis argutis patulis fere pinnatifidum, superiora minora, angustiora, inferne vulgo grosse dentata; omnia *utrinque marginibusque pilis sparsis haud tenuibus vestita* (raro *glabrescentia*), petiolis dense pilosis. *Anthela furcato-racemoso-corymbosa*, 2–10(–20)-cephala, ramis longis rigidis suberectis aeladium superantibus, pedunculis floccosis, pilis numerosis longis patulis basi obscuris glandulisque nonnullis brevioribus obsitis. *Involucra mediocria ad majuscula*, basi subtruncata. *Squamae* in gemmis incumbentes, *griseo-virides*, lineari-oblongae, intimis exceptis obtusae, *floccosae* (in *marginibus dense*), senescentes, *pilis densis longis pallidis glandulisque paucis minutis immixtis*. *Ligulae pallide luteae*, apice glabrae. Styli lividi. Alveoli receptaculi margine tenuiter subulato-dentati.

Stem 25–45 cm. high, rather slender, striate, pilose with pale, spreading hairs (densely so below) and becoming also floccose upwards. *Radical leaves* few, pale *caesious* or *greyish green*; the primordial ovate-lanceolate, obtuse-mucronate, denticulate, attenuate below to short, winged petioles; the later *oval-lanceolate*, acute to cuspidate, *sharply sinuate-dentate with larger teeth* (sometimes very large) towards the \pm *cuneate* base, the teeth sometimes decurrent on the normally short petioles; *stem-leaves* 2–3, the lowest sometimes resembling the inner basal, sometimes broader, shortly petioled, ovate-lanceolate, acuminate, and almost pinnatifid with few, very coarse, sharp, spreading teeth, the upper smaller and narrower, generally coarsely toothed below; all *with scattered, rather coarse pilose hairs* on both suriaces and the margins (occasionally glabrescent), with densely pilose petioles. *Inflorescence furcate-racemose-corymbose*, 2–10(–20)-headed, with long, straight, suberect branches exceeding

the accladium, the peduncles floccose, with numerous long, spreading, dark-based pilose and some shorter glandular hairs. Heads of medium size to rather large, subtruncate-based. Phyllaries incumbent in bud, greyish green, linear-oblong, obtuse (except the acute innermost), floccose (densely on the margins), senescent, with dense long, pale pilose hairs and a few minute glandular hairs intermixed. Ligules pale yellow, glabrous-tipped. Styles livid. Margins of receptacle-pits finely subulate-dentate. Achenes blackish brown, about 3.5 mm. long.

This distinct and beautiful hawkweed was collected at the same station in Upper Teesdale, Durham, in the years 1903, 1930 and 1933, and was formerly regarded as true *H. caesium* Fr. Earlier specimens from the same locality exist in herbaria under this and other names. A number of different forms have been identified with *H. caesium* by British botanists from Backhouse onwards, and Scandinavian and other Continental botanists also have not agreed as to the precise application of Fries's name. Lindeberg and Almquist attempted to define *H. caesium* Fr. by sending out their exsiccata Hier. Scand. Exs. no. 125, which is a plant near *H. farrense* Hanb. but slenderer and more glabrous. This may be thought to represent the *H. caesium* of Fries's *Epicrisis*, p. 92. Dahlstedt did not accept this view but based his interpretation of *H. caesium* more on the original description (Novit. Fl. Suec. I. 5, 76 (1819)), where the spreading foliar teeth and pinnatifid stem-leaf are emphasized. This form seems to match the exsiccatae Lindbg. Hier. Scand. Exs. no. 34 (as *H. bifidum* var. *majus*) and Dahlst. H. Exs. ii. 48. Dahlstedt's view, which is adopted by Zahn, appears to be preferable.

No British specimens have been traced to which Fries's name, *H. caesium*, in this restricted sense, can be satisfactorily applied, and Linton's set no. 113 (*H. caesium*, Ben Loyal) seems doubtfully distinguishable from *H. farrense* Hanb. as remarked under *H. subramosum*. The Teesdale plant here described closely resembles *H. caesium*, as understood by Dahlstedt, in the form and colour of its foliage, but it is strongly hirsute both in stem and leaves while the Scandinavian plants are glabrate throughout, and its inflorescence and heads are much more pilose and glandular. It is therefore treated as a distinct species, *H. caesiopilosum*. A form growing at Killin, in Perthshire, which deserves further investigation, is perhaps nearer to the restricted *H. caesium* Fr.

Distribution.—66. Durham : Upper Teesdale !

Endemic.

139. *HIERACIUM DECOLOR* Ley in Journ. Bot. xlvii. 10 (1909).

H. caesium var. *decolor* W. R. Lint. Brit. Hier. 59 (1905) ; *H. saxifragum* subsp. *Pseudo-Leyi* Zahn, l. c. 251 (1921) ?

Icon.—Pl. 8, fig. b.

Exsicc.—Linton no. 179 ; Marshall nos. 3726 and 3727 ; Pugsley no. 414 ; all from Great Orme's Head, in Hb. Mus. Brit.

Stem 15–40(–55, cult.) cm. high, slender, usually purplish below, ± floccose throughout, sparingly pilose towards the base, and with a few dark-based pilose and fine glandular hairs above. Radical leaves suberect, dull caesious green, with long, purplish petioles ; the primordial oval to oblong-ovate, obtuse-mucronulate, denticulate or slightly dentate towards the rounded base ; the later elliptic- to oblong-lanceolate, obtuse-mucronate to acute, denticulate to sharply serrate, with sometimes a few rather long, spreading teeth below, with cuneate or more rarely shortly narrowed base ; stem-leaf generally 1, linear-lanceolate, acute, sharply toothed, subsessile, or sometimes smaller and bractlike ; all glabrate (rarely with scattered setiform hairs) above, pilose beneath, on the margins and especially the petioles (leaves usually all longer and narrower in cultivation). Inflorescence furcate-racemose-corymbose,

1-6(-10, cult.)-headed, sometimes with long lower branches, especially when cultivated, the peduncles floccose with \pm numerous dark glandular and occasional pilose hairs. *Heads of medium size*, subtruncate-based. *Phyllaries* incumbent in bud, *greyish green*, rather short, linear-oblong, subacute, *very densely floccose* (especially on the margins), *with numerous dark glandular and pilose hairs*. Ligules clear, bright yellow, glabrous-tipped. *Styles pure yellow*. Margins of receptacle-pits subulate-dentate with long, fine teeth. Achenes blackish, 3.5-3.75 mm. long.

β . attenuatum var. nov.

Exsicc.—Pugsley, Giggleswick, 1919 (type), in Hb. Pugsley; Cryer, Gordale, 1910, in Hb. Mus. Brit.

Folia quam typi breviora, nonnunquam in petiolum magis abrupte contracta. Squamae longiores, acutiores, in gemmis porrectae, magis pilosae, minus glandulosae. Ligulae apice breviter pilosae.

Leaves with shorter pilose hairs than in the type, and sometimes more shortly narrowed to the petioles. Phyllaries longer and more acute, porrect in bud, with more pilose and fewer glandular hairs. Ligules shortly pilose-tipped.

This hawkweed, at first described as a variety of *H. caesium*, possesses the general features of this group, with a tendency to develop the characteristic Oreadean hair-clothing. This led Ley, on raising it to specific rank, to transfer it to the *Oreadea*. Its radical rosette of suberect, narrow, caesious leaves is very distinct, and it grows vigorously under cultivation, producing still narrower foliage and a long, lax inflorescence. On the whole, it appears most nearly related to such plants as *H. caesiopilosum* and *H. farrense*, and to be best retained among the Caesian species. The variety *attenuatum* is well represented in Herb. Hanbury.

H. caesium var. *Smithii* Baker in Journ. Bot. xvii. 361 (1879) is referred to this species by W. R. Linton (l. c.) but more than one plant was evidently covered under this name.

Distribution.—49. Carnarvon: Great Orme's Head!

var. *attenuatum*.

64. M.W. Yorks: Giggleswick! Sincarsett and Gordale (Hanbury).

Endemic.

140. *HIERACIUM FULVOCAESIUM* Pugsley in Journ. Bot. lxxix. 196 (1941).

H. orarium var. *fulvum* Hanb. in Journ. Bot. xxxii. 229 (1894); in Bab. Man. ed. 9, 257 (1904); W. R. Lint., Brit. Hier. 65 (1905), partim.

Exsicc.—Hanbury, Bettyhill, 1887 (type), in Hb. Hanbury; Linton no. 93, in Hb. Mus. Brit.

Stem 25-40 cm. high, slender, pilose with numerous spreading, pale hairs, which become finer and black-based above and readily deciduous, rendering the stem scaberulous, the upper part of the stem also \pm flocculose. *Radical leaves* few, ascending, *light glaucescent green*; the primordial (rarely produced) elliptic, subacute, finely denticulate, shortly cuneate-based; the later *elliptic-lanceolate*, acute to acuminate, *sharply serrate* with ascending, sometimes uneven teeth, *attenuate below* to \pm long petioles; *stem-leaves* 2-3(-4), the lowest elliptic-lanceolate, acuminate, coarsely and sharply serrate (the teeth sometimes cusped), attenuate below and subpetiolate, the upper smaller, sometimes broader and incise-serrate, sometimes narrower and more bractlike; all *glabrescent above* and \pm softly pilose beneath, with shortly ciliate margins and villous petioles. *Inflorescence* *compactly paniculate-corymbose*, 1-8(-many, cult.)-headed, with short acaulium and short, erect-spreading branches, the peduncles densely flocculose with \pm numerous, spreading pilose and fine, dark glandular hairs. *Heads of medium size*, rounded below. *Phyllaries*

incumbent in bud, *dark greyish green*, linear-lanceolate, obtuse (except the innermost), *floccose* (*densely on the margins*), senescent, *with many dark-based pilose and fine, short, dark glandular hairs* intermixed. *Ligules orange-yellow*, glabrous-tipped, very short, making the flower-heads appear small. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 3 mm. long.

This rather striking and beautiful hawkweed, which has remained in herbaria as a variety under *H. orarium* Lindbg., seems too widely different to be held conspecific with that species. Its foliage is glaucescent instead of bright green, with longer petioles and deeper teeth. Its phyllaries are very different, being fairly glandular and markedly floccose-edged. And the short, orange-coloured ligules are also distinctive. In its aggregate of characters, *H. fulvo-caesium* might be held intermediate between *H. orarium* and *H. caesium*, as understood by Dahlstedt or Zahn, and it is evidently allied to *H. farrense* Hanb. It has been collected in some abundance near Bettyhill.

An Irish plant, found by Dr. Praeger in 1900 by Lake Conn, South of Derreen, in West Mayo, closely resembles *H. fulvo-caesium* although its ligules are longer. The specimens unfortunately are now in too poor condition for accurate determination.

Distribution.—108. W. Sutherland : Bettyhill (Hanbury).

Endemic.

141. *HIERACIUM ERYTHRAEUM* Linton MS. ex Pugsley in Journ. Bot. lxxix. 196 (1941).

H. orarium erythraeum W. R. Lint., Brit. Hier. 66 (1905).

Essicc.—Linton no. 143 (Melness) (type), as *H. orarium* var. *fulvum*, in Hb. Mus. Brit.

Caulis 30–40 cm., gracilis, basin versus \pm rubescens, pilosus (inferne densius), sursum \pm flocculosus. *Folia radicalia* humifusa, undulata, *marginibus rubicundis angustissimis pallide vel luteo-viridia*, plurima oblonga ad elliptico-lanceolatae, obtusa ad subacuta, dentibus multis inaequalibus patulis apiculatis et denticulis immixtis *sinuato-dentata*, inferne in petiolum rubro-tinctum \pm alatum attenuata; *caulina* 2–3, infimum lanceolatum, ut in radicalibus intimis dentatum, breviter petiolatum, reliqua minora, saepe angustiora, similiter dentata; omnia utrinque pilis breviusculis rigidis hirsuta, marginibus ciliatis petiolisque villosis. *Anthela paniculato-corymbosa*, 3–8-cephala, ramulis satis brevibus pedunculisque flocculosis, pilis \pm numerosis, tenuibus, basi obscuris vestitis, eglandulosis. *Involucra mediocria*, basi rotundata. *Squamae* in gemmis incumbentes, saepe paululum tortae, marginibus pallidioribus olivaceae, lineari-oblongae, satis angustae, subacutae, *dense floccosae* (praesertim apicem versus in marginibus), pilis multis basi obscuris obsitae, eglandulosae. *Ligulae aurantiacae*, apice glabrae. Styli fusi. Alveoli receptaculi margine \pm dentati.

Stem 30–40 cm. high, slender, \pm reddish about the base, pilose, especially below, and \pm flocculose above. *Radical leaves* spreading, undulate, *pale or yellowish green*, mostly with very narrow, reddish margins; the primordial small, oblong, obtuse-mucronate, denticulate, shortly narrowed below; the later oblong to elliptic-lanceolate or lanceolate, obtuse to subacute, *sinuate-dentate* with many irregular, spreading, apiculate teeth interspersed with denticulations, *attenuate below* to \pm winged, red-tinted petioles; *stem-leaves* 2–3, the lowest lanceolate, toothed like the inner basal and shortly petioled, the upper smaller and often narrower, similarly toothed; all pilose on both surfaces with rather short, stiff hairs, the margins ciliate and petioles villous. *Inflorescence paniculate-corymbose*, 3–8-headed, with rather short branches, the peduncles flocculose, with \pm numerous fine, dark-based pilose hairs, eglandular. *Heads of medium size*, rounded below. *Phyllaries* incumbent in bud, often laterally

twisted, *olive-green with paler margins*, linear-oblong, rather narrow, subacute, *densely floccose* (especially on the margins towards the apex), *with many dark-based pilose hairs, eglandular*. *Ligules orange-yellow*, glabrous-tipped. Styles fuscous. Margins of receptacle-pits \pm dentate. Achenes blackish, about 4 mm. long.

This plant was originally collected in 1897 by Marshall and Shoolbred at Melness, in Sutherland, and was referred to *H. orarium* var. *fulvum* Hanb. Specimens sent by Linton to Hanbury were named by him *H. proximum* Hanb., and on their return, Linton wrote an account of the plant, under the name *H. erythraeum*, in which he pointed out its marks of distinction from *H. proximum*, and also from *H. rubiginosum* and *H. orarium*. This description was not published, and on hearing subsequently that Marshall did not agree with Hanbury, Linton acquiesced in the former's original naming and utilized the specimens for no. 143 of his set of exsiccatae, as *H. orarium* var. *fulvum*. The labels of no. 143 were printed accordingly, but in the subsequent list of exsiccatae var. *fulvum* was changed to var. *erythraeum*. W. R. Linton (l. c.) remarked that the plant appeared to be a state of *H. orarium* due to situation and an exceptional season, but the specimens show no signs of abnormality and precisely similar material was again obtained at Melness by Shoolbred in 1900.

H. erythraeum, on which Marshall commented as 'a lovely plant', has somewhat the facies of *H. proximum* but is a dwarfer plant with very different leaf-cutting and much smaller heads. Its orange-coloured ligules recall *H. fulvocaesium*, but in other respects it shows but little resemblance to this species or to *H. orarium*.

Distribution.—108. W. Sutherland : Melness (Marshall).

Endemic.

142. *HIERACIUM FARRENSE* F. J. Hanbury in Journ. Bot. xxvii. 75 (1889); in Bab. Man. ed. 9, 245 (1904); Williams, l. c. 123 (1902); W. R. Lint. Brit. Hier. 59 (1905); *H. caesium* subsp. *farrense* Zahn, l. c. 448 (1921).

Exsicc.—Hanbury, Bettyhill, 1888; Linton no. 10; Linton, Glen Shee, 1889; Marshall no. 3059; all in Hb. Mus. Brit.; Pugsley no. 557 (Heseldon Glen, 1919), in Hb. Pugsley.

Stem 30–60 cm. high, slender, striate, sometimes reddish below, \pm pilose throughout and floccose above. *Radical leaves* few, *pale green or glaucescent*; the primordial (when produced) oval, obtuse, subentire, shortly narrowed below; the later *oral-lanceolate* to lanceolate, obtuse-mucronulate to acute, *denticulate* or shallowly sinuate-dentate in the lower half, gradually *attenuate below to long, slender petioles* (shorter in Wicklow form); *stem-leaves* 2–3(–5, cult.), the lowest petiolate and resembling the innermost basal, the upper smaller, ovate-lanceolate, acuminate, more deeply dentate, subsessile; all \pm *pilose on both surfaces* (or glabrescent above) and the margins with rather stiff hairs, the cauline usually also slightly floccose beneath, the petioles villous. *Inflorescence paniculate-corymbose*, 2–10(–20, cult.)-headed, with normally a short accladium and straight, erect-spreading branches, the peduncles densely floccose with \pm numerous pilose and fine glandular hairs. *Heads of medium size*, rounded-based. *Phyllaries* incumbent in bud, often laterally twisted, *dark greyish green* with paler margins, linear-lanceolate, obtuse or subacute, *densely floccose* (especially on the margins), senescent, *with \pm numerous short pilose and fine glandular hairs* intermixed. *Ligules* deep yellow, glabrous-tipped. Styles light livid. Margins of receptacle-pits shortly dentate ap. W. R. Linton. Achenes blackish, 3–3.5 mm. long.

H. farrense is allied to the Scandinavian *H. laeticolor* Almq., to which Dahlstedt refers the exsiccata Lindeberg Hier. Scand. Exs. no. 125 (as *H. caesium*). *H. laeticolor* may be distinguished from *H. farrense* by its still slenderer habit, with nearly glabrous

stem and foliage, and eglandular heads. As already remarked under *H. subramosum*, the exsiccata Linton no. 113 (as *H. caesium*) from Ben Loyal, in Sutherland, appears conspecific with *H. farrense*, differing only in its dwarfer and more robust growth and rather more dentate foliage. A specimen in Herb. Mus. Brit. (Scarp, Outer Hebrides, coll. Duncan), labelled '*H. farrense*' by Hanbury, seems to belong to *H. Beebyanum*.

Distribution.—64. M.W. Yorks : Buckden (Cotton). Heseldon Glen ! 86. Stirling : Denny (Stirling). 89. E. Perth : Glen Shee (Linton). 90. Forfar : Clova (Linton). 92. S. Aberdeen : Braemar (Linton). 108. W. Sutherland : Bettyhill (Hanbury.)

Ireland.—19. Kildare : Ballymore Eustace (Praeger). 20. Wicklow : Poulaphuca (Brunker). 39. Antrim : Sallagh Braes (Stewart).

Endemic.

143. *HIERACIUM PROXIMUM* F. J. Hanbury in Journ. Bot. xxvii. 76 (1889) ; in Bab. Man. ed. 9, 245 (1904) ; Williams, l. c. 156 (1902) ; W. R. Lint. Brit. Hier. 34 (1905) ; *H. Hanburyanum* Zahn, l. c. 206 (1921).

Exsicc.—W. R. Linton, Reay, 1888 ; Linton no. 11 (Reay, cult.) ; Marshall no. 1984 ; all in Hb. Mus. Brit.

Stem 30–60 cm. high, purplish below, densely long-pilose towards the base, less so upwards (with black-based hairs) and \pm floccose. *Radical leaves* few, *pale or yellowish green* ; the primordial oblong, obtuse, subentire ; the later *ovate-oblong* to oblong-lanceolate, obtuse-mucronulate, *subentire* or with distant, very shallow, glandular-apiculate teeth, generally *shortly narrowed below* ; *stem-leaves* 2–4(–7, cult.), the lowest shortly petioled and resembling the inner basal, the upper becoming smaller and sessile ; all *setose with bulbous-based hairs on both surfaces*, especially above (or the cauline often glabrescent above), with ciliate margins and villous petioles. *Inflorescence paniculate-corymbose*, 1–7(–many, cult.)-headed, with straight peduncles exceeding the accladium, the peduncles floccose and with a few dark-based pilose hairs. *Heads large*, subtruncate-based. *Phyllaries* incumbent in bud, often laterally twisted, *dark green with pale margins*, linear-lanceolate, subacute, the outer lax, floccose (densely on the margins up to the apex), *with many pale pilose and very few or no glandular hairs*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits subulate-dentate ap. W. R. Linton. Achenes blackish, about 4 mm. long.

β . lacustre var. nov.

Exsicc.—Pugsley no. 547 (Lodore, 1903-type), in Hb. Pugsley.

Caulis humilior, 20–35 cm. Folia radicalia numerosiora, plane glauca. Anthela 3–6-cephala flosculis stylosis. Aliter ut in typo.

Stem lower, 20–35 cm. high. Radical rosette more developed, with distinctly glaucous leaves. Inflorescence with 3–6-heads, stylose-flowered. Otherwise like the type.

H. proximum is one of the species whose affinities are open to question. When the name was published in 1889 (l. c.), without any real description, it was assigned to the group *Vulgata*, but in Babington's Manual Hanbury transferred it to the *Oreadea*, and W. R. Linton followed this arrangement. Zahn treats it, like *H. scoticum* Hanb., as a separate super-species, and says it is *H. anglicum-onosmoides*. The habit of growth, and the rough hair-clothing, together with the large heads, recall the cauligerous *Oreadea*, especially *H. scoticum*, but the hairs of the stem and of the foliage are also not unlike those of *H. rubiginosum* Hanb., of this Subsection, and show but little development about the leaf-margins, such as would be expected in an *Oreadean* species. Moreover, the incumbent and floccose-edged phyllaries, and

also the livid styles, are not characteristic of the *Oreadea*, and the peculiar twisting of some of the inner phyllaries is like that which obtains in *H. farrense* and other species of the same group. In its general aspect *H. proximum* looks like a robust *H. farrense* with large, shaggy heads, and indeed, in Hanbury's herbarium there are sheets both of *H. farrense* and *H. erythraeum* that have been named '*H. proximum*'. It therefore seems best to place *H. proximum* in the Subsection *Caesia* of the *Vulgata*, next to *H. farrense*. The leaves of the Kildare and Donegal specimens in Herb. Dublin are much less hirsute than those of the Scottish form.

The name *H. Hanburyanum* was created by Zahn on the ground that *H. proximum* Norrlin was earlier than Hanbury's name. This seems to be erroneous, for *H. proximum* Hanb. was published in March 1889, while Norrlin's *H. proximum* was issued in a set (Hb. Mus. Fenn. ii. 151) in that year but not described till later.

Distribution.—109. Caithness : Thurso ! Reay (Linton).

Ireland.—19. Kildare : Poulaphuca and Ballymore (Praeger). 34. E. Donegal : Stranorlar (Hart). 35. W. Donegal : Martin's Bridge (Hart). 39. Antrim : Ballintoy (Brennan).

var. *lacustre*.

70. Cumberland : Lodore !

Endemic.

144. *HIERACIUM ANGUSTISQUAMUM* (Pugsley) Pugsley in Journ. Bot. lxxix. 197 (1941).

H. holophyllum var. *angustisquamum* Pugsl. in Journ. Bot. lviii. 284 (1920).

Exsicc.—Marshall no. 3090 ; Ley, Cheddar, 1905 ; both in Hb. Mus. Brit. ; Pugsley, Cheddar, 1902 (type), in Hb. Pugsley.

Stem 40–60 cm. high, slender, reddish and \pm pilose towards the base, sparingly floccose throughout. Radical leaves few, thick, *bright green above, often reddish purple beneath* ; the primordial, when produced, small, oval, very obtuse or even retuse, mucronulate, subentire, abruptly narrowed below ; the later *oblong to elliptic-lanceolate*, rounded-obtuse-mucronulate to subacute, *finely and remotely denticulate, shortly cuneate-based* ; stem-leaves 2–4 (usually 3), the lowest elliptic-lanceolate, acute, denticulate or slightly dentate below, subsessile, the upper smaller and narrower, sessile ; all *glabrescent* on both surfaces or \pm floccose beneath, the earlier sometimes with some short pilose hairs, the margins shortly ciliate and the \pm short petioles \pm floccose as well as pilose. Inflorescence *paniculate-corymbose*, 2–10-headed, with straight, \pm long, suberect, branches exceeding the accladium, the peduncles bracteolate with linear, ciliate bracteoles, densely floccose, and with scattered short, dark glandular and occasional pilose hairs. Heads of medium size, rounded below. Phyllaries incumbent in bud, *greyish green* (the inner with pale margins), numerous, rather narrow (the outer lax), linear-lanceolate, contracted above but obtuse, *densely floccose* (especially on the margins below), senescent, *with long, dark-based pilose and short, fine, dark glandular hairs* intermixed. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits subulate-dentate. Achenes reddish black, 3.25–3.5 mm. long.

This plant, when first collected at Cheddar, was referred to *H. flocculosum* Backh., and afterwards by Ley to *H. rubiginosum* Hanb. In 1920 it was described as a new variety of *H. holophyllum* W. R. Linton. Although allied to *H. holophyllum*, it differs considerably in its taller growth with more cauline leaves, its more paniculate inflorescence, its distinctly narrower, more hirsute phyllaries and its discoloured styles. It is therefore now treated as a separate species peculiar, like *H. lima*, to the limestone cliffs of Cheddar,

A plant collected by Ley in 1895 in Cwm Tarell, Brecon (in Herb. Hanbury), bears some resemblance to *H. angustisquamum* but has much larger and long-stalked foliage.

Distribution.—6. N. Somerset : Cheddar !

Endemic.

145. *HIERACIUM EUSTALES* Linton in Journ. Bot. xxxi. 195 (1893) ; Williams, l. c. 123 (1902) ; Hanb. in Bab. Man. ed. 9, 245 (1904) ; W. R. Lint. Brit. Hier. 60 (1905) ; *H. caesium* subsp. *eustales* Zahn, l. c. 448 (1921).

Exsicc.—Linton, Allt Dubh Galair, 1891, and Meal Ghaordie ; both in Hb. Mus. Brit.

Stem 30–45 cm. high, slender, with some scattered pilose hairs chiefly near the base, and \pm floccose above with a few fine, dark pilose and glandular hairs. *Radical leaves* few, *light green* ; the primordial small, subrotund-oval, rounded-obtusely-mucronulate, subdenticulate, abruptly narrowed below ; the later *lanceolate*, acute, *subentire* or obscurely denticulate, *attenuate below* to \pm long, red-tinted petioles ; *stem-leaf* 1, lanceolate, acute, entire or denticulate, \pm petiolate ; all \pm pilose on both surfaces and the margins or sometimes glabrescent above, petioles villous. *Inflorescence* *racemose-corymbose*, usually 2–6-headed, with straight, suberect peduncles, which are floccose, with many fine, dark glandular and occasional pilose hairs. *Heads* of *medium size*, rounded below. *Phyllaries* incumbent in bud, *greyish green*, rather narrow, linear-lanceolate, mostly acute, *floccose* (densely so on the margins up to the apex), senescent, *with numerous unequal, dark glandular and long pilose hairs* intermixed. *Ligules* *pilose-tipped*. Styles livid. Margins of receptacle-pits unknown. Achenes blackish, 3.5–3.75 mm. long.

H. eustales appears to be a rare species, with foliage somewhat recalling that of *H. farrense* but bearing a single stem-leaf. Its pilose-tipped ligules and the longer pilose hairs of its phyllaries further distinguish it.

It is not well represented in herbaria, and a number of specimens so named differ in their broader and less floccose phyllaries or their more shortly petioled leaves. Such plants require further investigation.

Distribution.—88. Mid Perth : Meal Ghaordie (Linton). Allt Dubh Galair (Linton).

Endemic.

146. *HIERACIUM INSULARE* F. J. Hanbury in Journ. Bot. xxxii. 229 (1894) ; in Bab. Man. ed. 9, 255 (1904) ; *H. caesium* var. *insulare* Hanb. in Journ. Bot. xxx. 368 (1892) ; W. R. Lint. Brit. Hier. 58 (1905) ; *H. flocculosum* var. *insulare* Williams, l. c. 119 (1902) ex parte ; *H. subramosum* subsp. *insulare* Zahn, l. c. 460 (1921).

Exsicc.—Hanbury and Marshall, Am Binnein, 1889, in Hb. Mus. Brit.

Stem 15–30(–40) cm. high, slender, pilose throughout, becoming also floccose upwards. *Radical leaves* few, suberect, *deep green* up. Hanbury ; the primordial rotund-ovate, rounded-obtusely-mucronulate, distantly denticulate, shortly narrowed below ; the later *oblong to long-lanceolate*, obtuse-mucronate to acute, *denticulate* or sinuate-dentate in the lower half, *attenuate below* and sometimes decurrent on the long petioles ; *stem-leaf* 1, lanceolate like the inner basal, acuminate, \pm toothed and subsessile, or smaller, linear, subentire ; all clothed with *pilose* hairs on both surfaces and the margins, the hairs more numerous on the midrib beneath and on the petioles. *Inflorescence* *furcate-corymbose*, 1–2(–6)-headed, with rather short peduncles, which are

densely floccose, and with \pm numerous pilose and short glandular hairs. *Heads* of medium size or rather large, rounded below (cylindrical in bud ap. Hanbury). *Phyllaries* incumbent in bud ap. W. R. Linton, *greyish green, rather broad, linear-oblong, obtuse, densely floccose* (especially below), strongly senescent, *with \pm numerous short pilose and dark glandular hairs*. Ligules deep yellow, glabrous-tipped. Styles livid ap. Hanbury. Margins of receptacle-pits. . . . Achenes. . . .

H. insulare, a rare species like the preceding, is a distinct and rather handsome plant usually bearing but a single head in its original station on Am Binnein. Some of the specimens from the other Perthshire localities are taller and produce occasionally as many as six heads. In his original description Hanbury notes a peculiar lateral curve from the apex of the leaves to the base of the long, shaggy petioles, which is scarcely to be recognized in the dried specimens.

Distribution.—88. Mid Perth : Am Binnein and Ben Lawers (Hanbury). Killin (Linton). Corrie Ardran (Marshall).

Endemic.

147. *HIERACTIUM LEYIANUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. pollinarium var. *platyphyllum* Ley in Journ. Bot. xxxvi. 7 (1898) ; *H. caledonicum* var. *platyphyllum* Ley, l. c. xxxix. 167 (1901) ; Hanb. in Bab. Man. ed. 9, 246 (1904) ; *H. platyphyllum* W. R. Lint. Brit. Hier. 50 (1905), non Arvet-Touvet, Hier. Alp. 124 (1888) ; *H. sagittatum* subsp. *Leyianum* Zahn, l. c. 346 (1921).

Exsicc.—Linton no. 90 (Taren yr Esgob) ; Ley, Taren Llwyd, 1896, Black Mt., 1898 ; all in Hb. Mus. Brit.

Stem 30–60 cm. high, *robust*, purplish and \pm pilose below, becoming floccose upwards. *Radical leaves* few, thick, *deep bluish (caesious) green* and generally purpurascent beneath ; the small primordial often absent ; the later *subrotund-ovate* or oval to ovate-lanceolate, obtuse-mucronate to acute, sharply *glandular-denticulate* (or sometimes finely dentate), *rounded* or shortly contracted below ; *stem-leaves* 1–2, the lower ovate-lanceolate, acuminate, denticulate or finely dentate, rounded below and \pm petiolate, the upper, if present, small and bractlike ; all *glabrescent above* and \pm pilose, chiefly on the midrib, beneath (sometimes also slightly floccose), with ciliate margins and \pm villous, winged petioles. *Inflorescence* *racemose-corymbose*, 2–7-headed, with long, stiffly erect branches and peduncles, which are densely floccose, with scattered spreading, black-based pilose and a few fine, dark glandular hairs. *Heads* *rather large*, subtruncate-based. *Phyllaries* connivent in bud, *dark grey* with whitish margins, *very broad*, linear-oblong (narrowed in the upper half), *obtuse, densely floccose* (especially on the margins), senescent, *with numerous whitish, black-based pilose and a few shorter, dark glandular hairs*. Ligules usually \pm stylose. Styles livid. Margins of receptacle-pits *dentate-fimbriate*. Achenes reddish black, about 4 mm. long.

H. Leyianum is a distinct species apparently most nearly allied to *H. holophyllum* W. R. Lint. Its thick, caesious, more or less ovate leaves are unlike those of any other British species, and its phyllaries are remarkably broad and obtuse. Its inflorescence also is peculiar, and its dentate-fimbriate receptacle-pits form another anomalous feature. All of the specimens seen in herbaria (with one exception), and in the living state in one station, bore stylose flowers.

A hawkweed discovered at Portland has been referred to this species, but it seems to differ materially in having much narrower phyllaries. This plant deserves further investigation.

Distribution.—35. Monmouth : Black Mt. (Ley). 36. Hereford : Hatterels (Ley). 42. Brecon : Taren yr Esgob and Taren Llwyd (Ley). Brecon !

Endemic,

148. *HIERACIUM HOLOPHYLLUM* W. R. Linton in Journ. Bot. xxviii. 376 (1890); Brit. Hier. 49 (1905); Williams, l. c. 147 (1902); Hanb. in Bab. Man. ed. 9, 256 (1904); *H. vulgatum* var. *cinereum* Backh. Mon. 61 (1856); *H. subramosum* subsp. *holophyllum* Zahn, l. c. 464 (1921).

Exsicc.—Linton no. 39 (Dovedale); Linton, Tunsley Dale, 1898; Hume, Great Orme's Head, 1905; all in Hb. Mus. Brit.

Stem 20–40(–50, cult.) cm. high, erect, \pm purplish below, pilose (chiefly towards the base) and floccose upwards. *Radical leaves* few, thick, suberect, *deep bluish green* and \pm purpurascens beneath; the primordial, if developed, small, oval, rounded-obtuse, subentire, shortly contracted below; the later *oval* to ovate- or elliptic-lanceolate, obtuse-mucronulate to subacute, *subentire* to obscurely denticulate, rounded- or shortly cuneate-based; *stem-leaves* generally 2, the lower lanceolate, acute, denticulate, \pm petiolate, the upper smaller, narrow and sessile, sometimes bractlike; all *glabrescent* or rarely shortly pilose *above*, with scattered pilose hairs, chiefly on the midrib, beneath (sometimes also \pm floccose), the margins shortly ciliate and the petioles floccose and pilose. *Inflorescence* *racemose-corymbose*, 2–6-headed, with straight, long or short, suberect branches, the peduncles densely flocculose with some scattered pilose or very fine glandular hairs. *Heads* of medium size, truncate-based. *Phyllaries* incumbent in bud, *greyish green* with broad, pale margins, numerous, broad (the outer lax), linear-lanceolate, contracted above but very *obtuse*, *densely floccose* (especially below and on the margins), senescent, with \pm numerous dark-based pilose and occasionally a few, fine glandular hairs. *Ligules* glabrous-tipped. *Styles* yellow. Margins of receptacle-pits finely laciniate-dentate. Achenes blackish, 3.5–4 mm. long.

β . dentulum Lint. in Journ. Bot. xlix. 356 (1911).

Exsicc.—Linton, Arncliffe, 1904; Ley, Kettlewell and Heseldon Glen, 1904; all in Hb. Mus. Brit.

Leaves finely denticulate, broader but more acute than in the type, pilose on both surfaces with short, subsetiform hairs. Peduncles less flocculose, with scattered fine glandular as well as pilose hairs. Phyllaries dark green, mostly obtuse, sparingly floccose. Styles fuscous. Otherwise like the type.

H. holophyllum differs from *H. Leyianum* in its normally narrower foliage and its less broad phyllaries, and it is not known to produce stylose flowers. The plant of the Great Orme's Head is dwarfer than the Derbyshire form, with a more compact inflorescence, as might be expected from its more exposed habitat. The variety *dentulum* is somewhat intermediate between the typical form and *H. rubiginosum* Hanb.

Distribution.—49. Carnarvon: Great Orme's Head! 57. Derby: Dovedale and Tunsley Dale (Linton). Ashwood Dale (Ley).

var. *dentulum*.

64. M.W. Yorks: Arncliffe (Linton). Kettlewell and Heseldon Glen (Ley). Grassington!

Endemic.

Subsection **Eu-Vulgata.**

W. R. Lint. Brit. Hier. 5 and 63 (1905) emend.; Zahn, l. c. 284, with *H. diaphanoides*, *H. vulgatum* and *H. laevicaule* Zahn, l. c. 349, 360 and 390 (1921), pro maj. parte.

Cauligerous, often hypophyllopodous plants, with the stem usually pilose, and floccose above; stem-leaves (1)–2–6(–20), generally decreasing gradually in size upwards. Radical leaves (sometimes only 2–3) dark, bright or greyish green, rarely

glaucous or glaucescent, \pm cuneate-based. Inflorescence paniculate-corymbose, few- to many-headed. Heads small or of medium size, rarely rather large, usually rounded- or subtruncate-based. Phyllaries incumbent in bud (except in *H. subminutidens*), \pm floccose (except in *H. diaphanum*, *H. praesigne* and *H. diaphanoides*), epilose or with rather short pilose hairs (long in *H. Roffeyanum*), \pm glandular with strong or weak, long or short, usually dark glandular hairs. Ligules glabrous-tipped (unless sometimes in *H. maculatum* and *H. Lachenalii*). Styles generally livid. Margins of receptacle-pits obscurely to subulate-dentate (slightly dentate-fimbriate in *H. maculatum*).

The species of this Subsection are usually readily distinguishable by their cauligerous habit, cuneate-based and often rather narrow foliage, and paniculate inflorescence, frequently with numerous heads. The phyllaries are generally well clad with glandular, pilose or floccose hair. The phyllopodous rosette of leaves is less constant and often less well marked than in the preceding Subsections other than the *Caesia*, and the small primordial outer leaves are sometimes scarcely produced. The habit may thus become intermediate between phyllopodous and aphyllopodous, approaching that which obtains among some of the *Alpestris* and of the *Rigida*. On the whole, however, all of the species here dealt with seem to belong naturally to the Section *Vulgata*.

The *Eu-Vulgata* are distributed over most of Central and Northern Europe, where they are frequently relatively common plants. They are spread over nearly the whole of Great Britain as far north as Caithness and occur, much more sparingly, in Ireland. Only one species, however, viz., *H. vulgatum*, grows freely in Scotland, and the group is most abundant, both as to species and individuals, in Wales and the southern half of England, where they affect chiefly sandy banks and roadsides, or light, open woods. Of the twenty-two British species, whereof twelve are endemic, fifteen are known for Wales and twelve for the south of England. Eleven occur in Northern England, and only three in Scotland and four in Ireland.

Series *Genuina* [Grex *H. vulgatum* Fr.].

Phyllaries with \pm numerous pilose and glandular hairs.

* Radical leaves narrow, oblong to lanceolate.

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|--|-----------------------------|
| Radical leaves normally dull green, with \pm sharp, ascending teeth; stem-leaves 2-5. Heads 3-many, of medium size or rather small, with greyish green phyllaries | <i>H. vulgatum</i> . |
| Radical leaves bright green, denticulate; stem-leaves 2-4. Heads 3-10, of medium size or rather small, with dull green, little clothed phyllaries. | <i>H. acroleucum</i> . |
| Radical leaves bright green, dentate; stem-leaves 3-5. Heads 5-15, of scarcely medium size, with olive-green, chiefly glandular phyllaries. Plant tall, \pm hypophyllopodous | <i>H. neopinnatifidum</i> . |
| Radical leaves dark green, subentire; stem-leaves 2-5. Heads 4-25, small, with olive-green, chiefly glandular phyllaries | <i>H. lepidulum</i> . |
| Radical leaves dark green, spotted, dentate; stem-leaves 3-5. Heads 6-20, of medium size, with greyish green, shortly glandular and slightly pilose phyllaries; margins of receptacle-pits obscurely dentate-fimbriate | <i>H. maculatum</i> . |
| Radical leaves pale green, spotted, sinuate-dentate; stem-leaves 2-3. Heads 3-6, of medium size, with olive-green, long-pilose phyllaries | <i>H. Roffeyanum</i> . |

** Radical leaves broader, oval to elliptic-lanceolate.

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|---|----------------------------|
| Radical leaves light green, \pm sinuate-dentate; stem-leaves 2-5. Heads 2-8, of scarcely medium size, with dull green phyllaries. Styles yellow. Plant slender | <i>H. surrejanum</i> . |
| Radical leaves dull green, narrower, sinuate-dentate, long-petiole; stem-leaves 2-3. Heads 10-25, rather small, with olive-green phyllaries. Plant \pm slender, with elongate panicle | <i>H. megapodium</i> . |
| Radical leaves large, light green, sinuate-dentate; stem-leaves 3-5. Heads 5-25, of medium size to rather large, with olive-green phyllaries. Plant robust | <i>H. subamplifolium</i> . |
| Radical leaves deep green, sinuate-denticulate; stem-leaves large, 5-7. Heads 3-20, of medium size, with dark green, sparsely clothed phyllaries, which are perfect in bud | <i>H. subminutidens</i> . |

Series *Sciaphila* [Grex (polymorphus) *H. Lachenalii* Gmel.].

Phyllaries glandular (usually densely) and epilose (rarely with solitary pilose hairs).

* Radical leaves \pm oblong, the cauline 2-4. Phyllaries blackish green, effloccose.

- Radical leaves bluish green, glandular-denticulate. Heads 3-10, of medium size, with obtuse phyllaries. Styles yellow *H. diaphanum*.
 Radical leaves dull, dark green, glabrescent, sinuate-dentate. Heads 5-25, of medium size or rather large, with obtuse (occasionally \pm pilose) phyllaries *H. praesigne*.
 Radical leaves bright green, \pm serrate-dentate. Heads 3-10, rather small and narrow, with normally subacute phyllaries *H. diaphanoides*.

** Radical leaves usually oblong-lanceolate to lanceolate-ovate, the cauline 1-4. Phyllaries sparingly floccose.

- Radical leaves green or tinted with red, glandular-denticulate. Heads 3-10, of medium size, with blackish green, subacute phyllaries *H. rectulum*.
 Radical leaves large, bright green, denticulate. Heads 4-10, rather large, with blackish green phyllaries. Plant robust, sparingly pilose *H. pulchrius*.
 Radical leaves small, \pm elliptic-lanceolate, greyish green, denticulate. Heads normally 3-12, broad and of medium size, with dark green phyllaries *H. submutabile*.

*** Radical leaves broader, ovate- or elliptic-lanceolate, the cauline 3-10 (-20). Phyllaries \pm floccose.

† Heads \pm small and narrow.

- Radical leaves \pm small, bright or greyish green, denticulate or \pm dentate; stem-leaves 3-5. Heads 4-10, with dull, dark green, slightly floccose phyllaries *H. daedalolepioides*.
 Radical leaves greyish green, \pm sinuate-serrate; stem-leaves 3-7. Heads 3-20(-40), with blackish green, sparingly floccose phyllaries. Plant often robust, with subumbellate panicle *H. anglorum*.
 Radical leaves light green, sharply toothed; stem-leaves 2-6. Heads 2-20, with olive-green, partially floccose phyllaries. Plant with lax panicle and long, slender, suberect branches *H. tunbridgensis*.

†† Heads of medium size.

- Radical leaves green, \pm dentate; stem-leaves 4-12. Heads 3-50, with deep olive-green, floccose phyllaries. Styles yellow or fuscous. Plant often robust and with pilose-tipped ligules *H. Lachenalii*.
 Radical leaves bright green, finely serrate-dentate; stem-leaves 4-6. Heads 1-10, with olive- or dark green, sparingly floccose phyllaries. Plant slender *H. strumosum*.
 Radical leaves bright green, dentate; stem-leaves 6-20, acuminate. Heads 10-many, with olive-green, floccose phyllaries. Plant hypophyllo-podous *H. acuminatum*.

Series **Genuina**. (See page 193.)

149. *HIERACIUM VULGATUM* (Fries pp.) Almquist in Thed. Fl. Upl. 361 (1871); Stud. öfver Sl. Hier. xxiv. (1881); *H. vulgatum* Fries, Novit. ed. 1, 76 (1819), ed. 2, 258 (1828), Symb. 115 (1848) and Epicr. 98 (1862), ex parte; Backh. Mon. 61 (1856), ex parte; Stenstr. Värml. Arch. 49 (1889); Dahlst. Bidrag. iii. 65 and 76 (1894); Williams, l. c. 152 (1902); Hanb. in Bab. Man. ed. 9, 258 (1904); W. R. Lint. Brit. Hier. 63 (1905); *H. vulgatum* var. *rosulatum* Syme, Eng. Bot. ed. 3, v. 197 (1866); *H. laevicaule* subsp. *triviale* var. *baltozum* Zahn, l. c. 398 (1921).

Icon.—Pl. 9, fig. a.

Exsicc.—Fries Hier. Eur. 96 b; Dahlst. H. Exs. ii. 92; Blytt, Christiania; Stenström, Wermland, 1885; Zahn Hier. Eur. 749 (Livonia); Linton no. 40 (Longridge); Bailey, Furness Abbey, 1867; Wilmott 2176 (Pitlochry); all in Hb. Mus. Brit.

Stem 20-80 cm. high, generally rather slender, sometimes purplish towards the

base, pilose (especially below) and floccose, increasingly so upwards. *Radical leaves dull or pale green*, often purpurascens beneath, sometimes few, sometimes numerous and usually in a spreading rosette; the outermost narrowly oblong, obtuse-mucronate, subentire or denticulate, attenuate below; the later *narrow-oblong to lanceolate* or elliptic-lanceolate, obtuse-mucronate to acute, *denticulate* or more commonly *with sharp, ascending teeth in the lower half, cuneate-based*; *stem-leaves* 2-4(-5), the lowest resembling the innermost basal and petiolate, the upper decreasing in size, lanceolate to linear-lanceolate, contracted below but sessile, sharply toothed towards the base, denticulate or subentire; all *with scattered pilose hairs on both surfaces*, with ciliate margins and long-pilose petioles, the cauline sometimes also \pm floccose beneath. *Inflorescence* paniculate-corymbose, the upper part often subumbellate, 1-20-headed, with straight, erect-spreading branches, the peduncles densely floccose or tomentose, with scattered pale or dark-based pilose and more rarely a few fine glandular hairs. *Heads of medium size or rather small*, rounded below. *Phyllaries* incumbent in bud, outer rather lax, *greyish green*, linear-lanceolate, subacute, floccose (especially on the margins), sometimes a little senescent, *with numerous whitish, dark-based pilose hairs* and generally a few fine, short glandular hairs among them. Ligules deep yellow, somewhat radiant, glabrous-tipped. Styles fuscous or livid. Margins of receptacle-pits shortly dentate. Achenes small, blackish, 2.5-3 mm. long.

β . triviale (Norrlin) comb. nov.

H. triviale Norrl. Bidrag, i. 104 (1888); *H. laevicaule* subsp. *triviale* v. *triviale* Zahn, l. c. 400 (1921); *H. vulgatum* v. *nemorosum* Lindbg. Hier. Scand. Exsicc. ii. 74, ex parte (1872)—nomen.

Icon.—Zahn, l. c. fig. 31.

Exsicc.—Lindbg. Hier. Sc. ii. 74 (partim), as *H. vulgatum* v. *nemorosum*; Dahlst. H. Exs. i. 85, as *H. pinnatifidum*; Ley, Ogwen Valley, 1904, as *H. pinnatifidum*; all in Hb. Mus. Brit.; Pugsley no. 558, in Hb. Pugsley.

Stem often tall (-80 cm.). Radical leaves normally few, ascending, \pm elliptic-lanceolate, sharply and irregularly serrate-dentate; stem-leaves (2-)3-5(-6), the lower large, elliptic-lanceolate or lanceolate, acuminate, with sharp, irregular teeth, \pm petiolate; the upper smaller, much toothed, sessile. Inflorescence usually lax, with long lower branches; peduncles rather long; phyllaries sparingly floccose, pilose, almost eglandular.

γ . sejunctum W. R. Linton in Journ. Bot. xxxix. 105 (1901); Brit. Hier. 63 (1905); Williams, l. c. 156 (1902); Hanb. in Bab. Man. ed. 9, 258 (1904); *H. laevicaule* subsp. *sejunctum* Zahn, l. c. 397 (1921).

Exsicc.—Linton no. 160 (Glen Roy); Marshall no. 3457; Barton, Arthog, 1915; all in Hb. Mus. Brit.

Plant usually robust. Radical leaves several, bright green, long-lanceolate, irregularly lacinate-dentate with long, spreading teeth (sometimes decurrent on the petiole) towards the shortly cuneate base; stem-leaves with long, spreading teeth in the lower half. Heads of medium size to rather large, the phyllaries usually glandular. Otherwise like the type.

δ . subfasciculare W. R. Linton, Brit. Hier. 64 (1905).

Exsicc.—Linton, Berriedale, 1888, in Hb. Mus. Brit.

Stem robust, often purplish, usually less pilose and floccose than in the type. Radical leaves \pm numerous, in a spreading rosette; the outer oblong, obtuse-mucronate, sinuate-dentate, especially towards the base; the inner lanceolate, acute, irregularly serrate-dentate; stem-leaves usually sessile or subsessile, with sharp or coarse teeth below. Inflorescence \pm umbellate or fastigiate above, with long lower branches, often many-(-30)-headed. Phyllaries pilose and glandular. Otherwise as in the type.

ε. *subravusculum* W. R. Linton Brit. Hier. 64 (1905).,

H. orarium var. *ravusculum* Williams, l. c. 150 (1902), non Dahlst.

Exsicc.—Linton no. 181 (Berwyn); Ley, Berwyn, 1903, and Ingleton, 1902; all in Hb. Mus. Brit.

Stem ± robust, often reddish. Radical leaves ± numerous, often in a spreading rosette; the inner with sharp, spreading teeth, sometimes increasing downwards; the cauline with coarse, irregular, spreading teeth about the abruptly narrowed base. Inflorescence 6–20-headed, generally with long, suberect branches much exceeding the acladium, the peduncles with many pilose hairs. Heads of medium size; phyllaries porrect in bud, acute, scarcely glandular. Otherwise like the type.

ζ. *pseudosubramosum* var. nov.

Exsicc.—Marshall no. 3152 (type), as *H. subramosum*, in Hb. Mus. Brit.

Caulis robustus. Folia caulina 5–8, lanceolata ad elliptico-lanceolata, basin angustatam versus grosse dentata. Anthela multi-(–30)-cephala, ramis longis subumbellatis acladium valde superantibus; involucria obscure griseo-viridia, pilis obscuris numerosis oblecta, fere eglandulosa. Aliter ut in typo.

Stem robust. Cauline leaves 5–8, lanceolate to elliptic-lanceolate, coarsely toothed towards the narrowed base. Inflorescence many-(–30)-headed, with long, subumbellate branches much exceeding the acladium; heads dark greyish green, with numerous dark pilose hairs, nearly eglandular. Otherwise like the type.

This species has been generally known in modern British botany as *H. vulgatum* Fr. and has been similarly named by Dahlstedt and other modern Scandinavian authors. In Zahn's monograph, however, where *H. vulgatum* Fr. is treated as a very large aggregate species with a great number of subspecies, this plant is placed as a subspecies (*H. triviale* (Norrlin)) not of *H. vulgatum* but of the French *H. laevicaule* Jord. Fries's different accounts of his *H. vulgatum* cannot readily be applied accurately in a segregate sense, and as he states that it is the commonest species throughout Europe, it may be assumed that the name really represents not a single form but a group of more or less allied plants. Fries was evidently acquainted with this particular plant which Norrlin subsequently named *H. triviale*, for it is an inhabitant of Scandinavia and was sent out in some of his sets in Herb. Norm. to represent *H. vulgatum*. It seems to have but little affinity with *H. laevicaule*, which is a subglabrous plant more like *H. irriguum* Fr. Dahlstedt, in his Bidrag (l. c.), cites his Hier. Exsicc. ii. 92 (1889) to illustrate *H. vulgatum* Fr. sensu stricto, and there is a sheet of this set in Herb. Hanbury, on which Elfstrand has written 'This, after careful comparison with Fries's specimens of *H. vulgatum* at Upsala, is considered by Swedish botanists as type *H. vulgatum*'. The plant on this sheet matches British *H. vulgatum* and seems specifically identical with Norrlin's *H. triviale*. Zahn appears to regard *H. Lachenalii* Gmel. as the type subspecies of his group-species *H. vulgatum* Fr., but *H. Lachenalii* can scarcely be held to agree with Fries's descriptions, and it is clear from his remark in the 'Epicrisis' (p. 99) that it is a form that he did not well understand. Moreover, it is not a Scandinavian species with which he would be likely to be familiar. It therefore appears undesirable to take up the name *H. triviale* Norrlin for the plant here described, and better to retain Fries's name, *H. vulgatum*, as amended by Almquist, in accordance with the views of Dahlstedt and most other authors.

H. vulgatum is probably the commonest and most widely spread phyllopodous hawkweed in Great Britain. It seems to occur throughout Scotland and in Northern England and North Wales, and it grows also in Ireland. It inhabits equally low-lying and mountainous districts, and is commonly found on the acid soils of heaths and moors in the north, where it is usually seen as a slender plant with sparing foliage and few heads. In rich soils and under cultivation it often develops a strong radical rosette of leaves and an ample panicle of flowers. The three varieties of W. R. Linton are normally vigorous plants, the distinctness of whose characters is not always

clear. The variety *pseudosubramosum* was collected in 1907 by E. S. Marshall and W. R. Linton as *H. subramosum* Lönnr. in what was thought to be its *locus classicus* in Fifeshire. Lindeberg's variety *nemorosum*, which Zahn treats as typical *H. triviale*, has been confused with *H. pinnatifidum* Lönnr. owing to a mixture of Lindeberg's specimens. There is a remarkable plant in Herb. Hanbury, collected in 1888 at St. Cyrus by Buchanan-White, which appears to be a vigorous, many-headed example of *H. vulgatum*, with extraordinarily long and narrow phyllaries, which almost equal the expanded ligules. It is probably a monstrosity.

The number of vice-counties shown for Ireland probably falls considerably short of the actual number. Praeger ('Botanist in Ireland') gives 17 vice-counties.

Distribution.—30. Bedford : Amptill (A. E. Ellis). 39. Staffs : Wetton Valley (Hanbury). 40. Shropshire : Herdersley (Ley). 42. Brecon : Hepste Glen (Riddelsdell). 47. Montgomery : Machynlleth (Druce). 48. Merioneth : Arthog (Barton). 49. Carnarvon : Llanberis! Bettws-y-Coed! Cwm Idwal! 50. Denbigh : Capel Garmon! Castle Dinas Bran (Foster). 52. Anglesea : Menai (Miss Todd). 57. Derby : Ambergate (Carr). Wirkworth (Headly). Ashwood Dale (Roffey). 58. Cheshire : Delamere (Brown). 60. W. Lanes : Langridge (Linton). Silverdale (Cryer). 62. N.E. Yorks : York (Backhouse). Hambledon (Baker). Scarborough (Cryer). Rievaulx (W. Foggitt). Goathland (Riddelsdell). 64. M.W. Yorks : Ribbleshead! Headingbay, Leeds (Pickard). 65. N.W. Yorks : Dent Dale (Oliver). 66. Durham : Upper Teesdale (Riddelsdell). Harwood Gill (Groves). 68. Cheviot-land : Cheviots (Evans). 69. Westmorland : Elter Water (Fisher). High Cup Ghyll (E. G. Baker). Furness Abbey (Bailey). Brathay (Roffey). Cross-y-Moor (Hodgson). 70. Cumberland : Keswick! 72. Dumfries : Moffat (W. C.). Sanquhar (Davidson). 73. Kirkcudbright : Glen Cree (Druce). 75. Ayr : Largs (Boyd). 77. Lanark : Symington (A. B. Jackson). 78. Peebles (A. B. Jackson). 80. Roxburgh : Galashiels (Hayward). 81. Berwick : Lammernmuirs (Evans). 83. Edinburgh (Hb. Soc. Bot. Lond.). 84. Linlithgow : Carriden (Geldart). 85. Fife : Kirkaldy (Syme). 86. Stirling : Larbert (Kidston). 88. Mid Perth : Methven (Hanbury). Lawers! Crianlarich! Menstrie Glen (Groves). 89. E. Perth : Killiecrankie (Groves). Pitlochry (Wilmott). Blair Athol (Druce). 90. Forfar : Clova! Carnoustie! 91. Kincardine : St. Cyrus (Buchanan-White). Muchals (Groves). 92. S. Aberdeen : Braemar! Glen Callater (E. G. Baker). Aberdeen Links (Beeby). 95. Elgin : Dumphail (Marshall). 96. E. Inverness : Tomatin (Fisher). Loch Eunach (Croves). Inverness (Burdon). Nairn (Marshall). 97. W. Inverness : Arisaig (Miller). Ben Nevis (Salmon). 98. Argyll : Clach Leathad (Hanbury). Tignabruaich (Salmon). 99. Dumbarton : Kilpatrick Hills (Watt). 100. Clyde Is. : Little Machrie, Arran (Somerville). 101. Cantire : Loch Errol (Salmon). 103. Mid Ebudes : Coll (K. B. Blackburn). 104. N. Ebudes : Raasay (Cooke). Eigg (W. F. Miller). 105. W. Ross : Strome (Druce). Loch Alsh (Shoolbred). Inverbroom (Riddelsdell). Kinlochewe (Salmon). 106. E. Ross : Tain (Marshall). Tor Echiltie (Druce). 107. E. Sutherland : Golspie (Grant). 108. W. Sutherland : Bettyhill (Linton). Inchnadamph (Marshall). 109. Caithness : Thurso (Riddelsdell). Dunbeath (Hanbury). 110. Outer Hebrides : Benbecula and S. Uist (Heslop-Harrison).

Ireland.—38. Down : Waringstown (Lett). Conlig (Praeger). 39. Antrim : Glenarm! 40. Londonderry : Dungiven (Hart). Benevenagh (Stewart). Magilligan (J. Ball).

var. *triviale*.

49. Carnarvon : Llanfairfechan! Menai Strait! Ogwen Valley (Ley). 66. Durham : Frankland Woods (Fox). 90. Forfar : Clova! 96. E. Inverness : Bridge of Brown (Marshall). 104. N. Ebudes : Sligachan, Skye (Roffey).

var. *sejunctum*.

48. Merioneth : Arthog (Barton). Drwsynant (Ley). 65. N.W. Yorks : Winch Bridge (Foggitt). 88. Mid Perth : Lawers (Marshall). 92. S. Aberdeen : Braemar! 96. E. Inverness : Glen Eunach (Groves). 97. W. Inverness : Glen Roy! Glen

Spean (Marshall). 100. Clyde Is. : Arran (Somerville). Bute (A. E. Ellis). 105. W. Ross : Duirinish (Marshall). 106. E. Ross : Tain (Marshall). 108. W. Sutherland : Inchnadamph (Marshall).

var. *subfasciculare*.

47. Montgomery : Pant (Foggitt). 49. Carnarvon : Aber ! 69. Westmorland : Ambleside (Fisher). 96. E. Inverness : Aviemore (Wilson). 109. Caithness : Berriedale (Linton).

Ireland.—7. S. Tipperary : Cahir (Praeger). 39. Antrim : Rasharkin (Praeger). var. *subravusculum*.

50. Denbigh : Berwyn (Ley). 57. Derby : Miller's Dale ! 64. M.W. Yorks : Ingleton (Ley).

var. *pseudosubramosum*.

85. Fife : Pettycur (Marshall).

General Distribution.—Scandinavia. Germany. Austria. Switzerland.

150. *HIERACIUM ACROLEUCUM* Stenström, Värml. Archier. 55 (1889) ; Dahlst. Bidrag, iii. 65 and 69 (1894) ; W. R. Lint. Brit. Hier. 64 (1905) ; *H. vulgatum* var. *acroleucum* Williams, l. c. 154 (1902) ? ; *H. laevicaule* subsp. *acroleucum* Zahn, l. c. 392 (1921).

Exsicc.—Stenström, Wermland, 1885 ; Dahlst. H. Exs. ii. 60 ; Ley, Llanberis, 1904 ; W. R. Linton, Chapel-en-le-frith, 1906 ; Pickard, near Leeds, 1908 ; all in Hb. Mus. Brit. : Dahlst. H. Sc. ii. 75 and 76, in Hb. Kew.

Stem 30–60 cm. high, slender, ± reddish below, pilose (chiefly towards the base), sparingly floccose above. *Radical leaves* normally few, *bright green, oblong-lanceolate*, obtuse-mucronate to subacute, *denticulate* or with fine, ascending teeth, which are sometimes coarser towards the cuneate base ; *stem-leaves* 2–4, the lower resembling the basal but more acute and with stronger teeth, contracted below to a winged petiole, the upper smaller and sessile, sometimes linear, entire, ± bractlike ; all *shortly pilose or glabrescent* on both surfaces (but sometimes ± floccose), with shortly ciliate margins and ± pilose petioles. *Inflorescence* paniculate-corymbose, 3–10-headed, with slender, suberect branches exceeding the accladium, the peduncles flocculose with scattered fine pilose hairs. *Heads of medium size or rather small*, rounded below. *Phyllaries* (porrect ?) in bud, *dull green*, linear-lanceolate, subacute, ± floccose especially along the margins, often tipped with purple, with ± *numerous dark pilose and frequently fewer fine, dark glandular hairs*. Ligules glabrous-tipped. Styles yellowish. Margins of receptacle-pits obscurely dentate. Achenes blackish, small, 2.5–2.75 mm. long.

β. *daedalolepium* Dahlst. Bidrag, iii. 71 (1894) ; W. R. Lint. Brit. Hier. 64 (1905), ex parte ?

Exsicc.—Dahlst. H. Sc. ii. 65, in Hb. Kew.

Leaves narrower than in the type ; phyllaries pale-edged, more acute and less floccose.

H. acroleucum is very closely allied to *H. vulgatum*, from which it appears to differ chiefly in its clear green foliage and its green rather than greyish phyllaries. It is a rare plant in Britain, and the few British examples examined that seem referable to it are not quite typical. Some of them resemble var. *daedalolepium* in the slight floccose clothing of their phyllaries.

Distribution.—49. Carnarvon : Llanberis (Ley). Bethesda (Hanbury). 57. Derby : Chapel-en-le-frith (Linton). 64. M.W. Yorks : Leeds (Pickard). 65. N.W. Yorks : Winch Bridge (Hanbury).

General Distribution.—South Scandinavia.

151. *HIERACIUM NEOPINNATIFIDUM* Pugsley, nom. nov., in Journ. Ecol. xxxiii. 346 (1946).

H. pinnatifidum Lönnroth ex Dahlst. in Bot. Not. 163 (1892); Bidrag, iii. 65, 88 and 90 (1894), excl. syn.; Ley in Journ. Bot. xlv. 110 (1907), ex parte; *H. vulgatum* subsp. *pinnatifidum* Zahn, l. c. 366 (1921); non *H. pinnatifidum* Willd. Sp. Pl. ed. 3, iii. 1560 (1800).

Exsicc.—Dahlst. H. Exs. i. 84; and Ley, Titley, 1908, as var. *vivarium*, in Hb. Mus. Brit.; Dahlst. H. Sc. ii. 87 (as var. *vivarium*) and x. 44, in Hb. Kew.

Stem 30–90 cm. high, \pm slender, erect, densely pilose below, becoming sparingly so above and somewhat floccose, with occasional glandular hairs. *Radical leaves* few (2–3), or the plant sometimes hypophyllopodous, *bright green*, ascending, *lanceolate*, subacute-mucronate to acute, *denticulate or with unequal, cusped teeth*, long-attenuate below to \pm long petioles; *stem-leaves* 3–5, the lowest petiolate, resembling the basal but more sharply and deeply toothed or even pinnatifid (Dahlstedt), the upper becoming smaller and sessile, and the uppermost sometimes linear, small and bract-like; all *sparingly pilose* on both surfaces, with ciliate margins and \pm villous petioles, the stem-leaves also \pm floccose beneath. *Inflorescence* paniculate-corymbose, 5–15-headed, with slender, suberect branches (the lower sometimes long), the peduncles densely flocculose, with \pm numerous dark glandular and some fine pilose hairs. *Heads of medium size or rather small*, rounded below. *Phyllaries* incumbent in bud, *olive-green*, linear-lanceolate, subacute, \pm floccose towards the base, *with rather numerous, fine, dark, unequal glandular and usually some pilose hairs*. Ligules glabrous-tipped. Styles fuscous or yellow. Margins of receptacle-pits sharply dentate. Achenes reddish brown, about 3 mm. long.

The above description has been drawn up from the exsiccatae cited, which differ slightly from the typical species, as described by Dahlstedt, in having less deeply cut leaves, and from the variety *vivarium* Lönnr. ex Dahlst. (Bidrag, l. c.) by their slightly narrower foliage.

An essential feature of *H. neopinnatifidum*, according to Dahlstedt's original account (l. c.) as well as Zahn's, is the densely glandular and sparingly pilose involucre, but one of Dahlstedt's exsiccatae of this species (H. Exs. i. 85) does not agree with the description, for its phyllaries (in the specimens seen) are strongly pilose and only very slightly glandular. This exsiccata well matches Lindeberg H. Sc. ii. 74 (*H. vulgatum* var. *memorosum*), in which, so far as material has been examined, the heads are pilose but virtually eglandular. Dahlstedt cites this plant of Lindeberg's as a synonym of *H. neopinnatifidum*, but Zahn states that the set Lindbg. H. Sc. ii. 74 is a mixture, partly *H. neopinnatifidum* and partly *H. vulgatum*. The specimens examined seem to differ essentially from *H. neopinnatifidum* and to represent a variety of *H. vulgatum* as named, and this variety has been adopted under Zahn's varietal name. Dahlstedt's exsiccata H. Exs. i. 85, as seen in Herb. Mus. Brit. and Herb. Hanbury, likewise belongs to *H. vulgatum* rather than *H. neopinnatifidum*.

Distribution.—36. Hereford: Lyonshall and Titley (Ley). 42. Brecon: Erwood (Roffey). 57. Derby: Bolsover (Linton).

General Distribution.—Scandinavia. Germany. France.

152. *HIERACIUM LEPIDULUM* Stenström, Värml. Archier. 50 (1889); *H. irriguum* subsp. *lepidulum* Dahlst. Bidrag, iii. 131 (1894); *H. vulgatum* subsp. *lepidulum* Zahn, l. c. 379 (1921).

Exsicc.—Dahlst. H. Exs. iii. 47; Sudre Hb. Hier. i. 36; both in Hb. Mus. Brit.; Pugsley, no. 559, in Hb. Pugsley.

Stem 25–50 (–60, cult.) cm. high, normally slender, purplish towards the base, pilose and \pm floccose above. *Leaves dark green*, often with purplish margins and

sometimes purpurascens beneath ; the *radical* usually few (2–3), *oblong*, rounded-obtuse-mucronulate, *subventre* to weakly denticulate or shallowly sinuate-dentate, cuncate-based ; *stem-leaves* 2–5, the lower oblong-lanceolate, obtuse-mucronate, \pm sinuate-denticulate (more coarsely toothed in cultivation), attenuate below to long or short, winged petioles, the upper smaller and narrower, becoming linear-lanceolate and bractlike ; all *with scattered pilose hairs* on both surfaces *but often glabrescent above*, with ciliate margins and pilose petioles, the upper stem-leaves often \pm floccose beneath. *Inflorescence* paniculate-corymbose, 4–25(–50, cult.)-headed, with slender, suberect branches exceeding the accladium (sometimes, especially in cultivation, with long lower branches from the axils of the stem-leaves), the peduncles densely flocculose, with numerous fine glandular and some fine pilose hairs. *Heads small*, subtruncate-based. *Phyllaries* subporrect in bud, *olive-green*, lanceolate-subulate, mostly acute, floccose (sometimes about the base only), *with numerous dark glandular and fewer longer pilose hairs*. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits shortly incise-dentate. Achenes blackish, 3 mm. long.

β . haematophyllum Dahlst. l. c. 133 (1894) ; *H. purpurascens* Dahlst. H. Exs. ii. 66 (1889), non Scheele ; *H. erubescens* Jord. ex Bor. Fl. Centr. ed. 3, ii. 398 (1857), pro parte.

Exsicc.—Dahlst. H. Sc. ii. 77, x. 42, xvi. 95 ; Sudre Hb. Hier. i. 34 ; all in Hb. Kew ; Zahn Hier. Eur. 884, in Hb. Mus. Brit. ; Pugsley no. 560, in Hb. Pugsley.

Stem leaves 2–6, often quickly decreasing upwards, purple or reddish. Glandular hairs of the phyllaries denser, often very short. Styles darker.

H. lepidulum is closely allied to *H. irriguum* Fr., near which it is placed both by Dahlstedt and by Zahn. It differs chiefly in its paler, more floccose and more pilose heads.

The British specimens cited were collected (type) on the railway bank near Box Hill, Surrey, in 1922 and subsequent years, and (variety) on railway sidings and banks near Winchester in 1934. No earlier examples have been met with in herbaria, and it seems probable that this plant like *H. praecox* Sch.-Bip., is a relatively recent introduction in this country, perhaps during the Great War. A further example, apparently referable to this species, was collected at Wymington, Beds., in 1944 by Dr. J. G. Dony.

Distribution.—17. Surrey : Box Hill !

var. *haematophyllum*.

11. S. Hants. : Winchester !

General Distribution.—France ! Switzerland. Germany. Tirol. Austria. Hungary. Bulgaria. Poland. Bohemia. Denmark. Sweden.

153. *HIERACIUM MACULATUM* Smith, Eng. Bot. xxx. no. 2121 (1810) ; W. R. Lint. Brit. Hier. 67 (1905) ; *H. murorum* γ . Smith, Fl. Brit. ii. 830 (1800) ; *H. silvaticum* β . Smith in Trans. Linn. Soc. ix. 240, excl. syn. partim (1808) ; *H. vulgatum* f. *maculatum* Backh. Mon. 63 (1856) ; *H. vulgatum* var. *maculatum* Hanb. in Bab. Man. ed. 9, 258 (1904) ; *H. maculatum* subsp. *maculatum* Zahn, l. c. 514 (1921).

Icon.—Eng. Bot. t. 2121 (E. B. ed. 3, 849).

Exsicc.—Norwich (cult.) in Hb. Smith ; Linton no. 68 (cult.) ; Marshall no. 2833 ; F. Schultz Hb. Norm. 2361 (Austria inf.) ; all in Hb. Mus. Brit. ; Pugsley, Prior Park, in Hb. Pugsley.

Stem 30–50(–80, cult.) cm. high, \pm robust, sometimes purplish below, densely pilose about the base, becoming less so but also floccose upwards. *Radical leaves* generally few, without any small primordial of distinct form, *dark green, much spotted*

with purplish brown (less so in shade), oblong to elliptic-lanceolate, acute, denticulate to dentate with ascending teeth (often \pm coarsely laciniate-dentate towards the base in cultivation), shortly narrowed below to long, sometimes winged petioles; stem-leaves 3-5, the lowest lanceolate to elliptic-lanceolate, acuminate, sinuate-dentate to deeply laciniate towards the base, petiolate, the upper gradually decreasing in size and becoming sessile and less deeply toothed; all pilose on both surfaces with rather stiff hairs, the margins shortly ciliate and the petioles villous. Inflorescence paniculate-corymbose, the upper part sometimes subumbellate, and the branches \pm spreading and much exceeding the aeladium, 6-20(-40, cult.)-headed, the peduncles densely flocculose with many small, dark glandular hairs. Heads of medium size, subtruncate-based. Phyllaries incumbent in bud, greyish green, lanceolate-subulate, acute, floccose (especially on the margins), with numerous short, dark glandular hairs and usually but few longer pilose hairs. Ligules glabrous- or occasionally pilose-tipped. Styles livid. Margins of receptacle-pits obscurely dentate-fimbriate. Achenes purplish black, 2.5-3 mm. long.

There is some degree of doubt respecting the status of this species in Britain, for although it has been collected in several counties, the typical form has not been found in certainly natural habitats. The specimens sent out by Linton as *H. maculatum* in the set no. 182, from a scaur near Ingleton, in Yorkshire, differ from Smith's type in their more glabrous foliage. Another form growing around Reigate, in Surrey, recalls the allied *H. arenarium* Schultz-Bip. ap. F. Schultz Archiv. de Fl. pp. 22 and 232 (1854), as represented by the exsiccata Schultz-Bip. no. 25 in Herb. Mus. Brit.; and that occurring at Chichester shows more important differences and is here treated as a separate species. Smith's plant seems to be related to the French *H. approximatum* Jord. The Snowdon plant that has been referred to *H. maculatum* is the Orcadian species *H. carneddorum*.

Zahn (l. c. 519) gives *H. maculatum* subsp. *Watsonii* (Jord.) for 'England'. This is a plant with unspotted leaves named by Jordan in herb. Boreau and apparently the only known specimen (vide Sudre Hier. Centr. Fr. p. 64.).

A record of *H. tinctum* Jord. var. *insignum* [sic] Sudre appears in the B. E. C. Report, ix. pt. iii, 272 (1931) on the authority of Zahn. This is based on a single example, collected at Clova and cultivated at Oxford, which bears one small stem-leaf and several large heads. It has not the aspect of *H. maculatum* Sm. (sensu lato), and its radical leaves resemble those of *H. maculosum* Dahlst. It seems questionable whether such a specimen can be determined with certainty and undesirable to admit it to the British list without further investigation.

The *Pulmonaria gallica sive aurea angustifolia* of Johnson's Gerard, p. 304 (1633) is probably referable to *H. maculatum*. The figure is adopted from Lobel, and is repeated by Petiver. The plant is said to grow in an old Roman camp, close to the Decumane fort, on the skirts of the hill near Newbury, in Berks. The station is termed Sidmonton in Ray's Synopsis. *H. maculatum* is still known in the county.

Distribution.—3. S. Devon: Manadon (Briggs). 6. N. Somerset: Cheddar (Foggitt). Prior Park, Bath! 7. N. Wilts: Limpley Stoke (Marshall). Avoncliff, Bradford (—). 16. W. Kent: Sydenham (Syme). 17. Surrey: Reigate! Wokingham (Salmon). 21. Middlesex: Twickenham (Dyer). 22. Berks: Buckland (Syme). 25. E. Suffolk: Holbrook (Fox). 26. W. Suffolk: Sudbury (Druce). 34. W. Glo'ster: Sapperton (Riddelsdell). 38. Warwick: Kenilworth (Fraser). Wootton (Bromwich). 39. Stafford: Codsall (Fraser). 49. Carnarvon: Twll Du (Griffiths). 62. N.E. Yorks: Hambleton (Baker). 64. M.W. Yorks: Ingleton (Ley). 69. Westmorland: — (Crowe).

Ireland.—14. Leix: Maryborough (Praeger). 21. Louth: Dundalk (Marsden).

General Distribution.—Germany. Austria.

154. *HIERACIUM ROFFEYANUM* Pugsley in Journ. Bot. lxxix. 197 (1941).

Exsicc.—Standen, Lindfield, 1899 (type); Marshall no. 2688 (Chichester); Wallace, Warninglid, 1935; all as *H. maculatum* in Hb. Mus. Brit.

Caulis 30–80 cm., gracilescens, striatus, inferne purpureo-tinctus, pilis longis patulis hirsutus, sursum floccosus \pm scaberulus. *Folia radicalia* pauca, laxe rosularia, *pallide viridia* praesertim in apricis \pm *brunneo-maculata*, *oblonga* ad oblongo-lanceolata, obtuso-mucronulata ad acuta, dentibus remotis haud altis patentibus *sinuato-dentata*, inferne in petiolos longos purpurascens attenuata (nonnunquam breviter primaria); *caulina* 2–3, infimum lanceolatum, acutum, basin attenuatam versus dentibus paucis claris patulis, petiolatum, superiora minora, aequae dentata, subsessilia, vel lineari-lanceolata, subintegra; omnia superne *glabrescentia* vel parce pilosa, inferne pilosiora, marginibus ciliatis petiolisque villosis. *Anthela* paniculato-corymbosa, 3–6-*cephala*, vulgo breviter ramosa, pedunculis floccosis pilis patulis glandulisque brevioribus nonnullis obsitis. *Involucra mediocria*, latiuscula, inferne rotundata. *Squamae olivaceae* (marginibus pallidioribus interiores), lanceolato-subulatae, subacutae, parce floccosae (praesertim basin versus) et senescentes, *pilis longis pallidis numerosis glandulisque paucis brevibus obscuris vestitae*. Ligulae apice glabrae. Styli lividi. Alveoli receptaculi margine subulato-dentati.

Stem 30–80 cm. high, rather slender, striate, purplish below, pilose with long, spreading hairs, \pm rough and floccose above. *Radical leaves* few, in a loose rosette, *pale green \pm spotted with brown*, especially in exposure, *oblong* to oblong-lanceolate, obtuse-mucronulate to acute, *sinuate-dentate* with distant, shallow, spreading teeth, attenuate below (the earliest sometimes shortly) to long, purple-tinted petioles; *stem-leaves* 2–3, the lowest lanceolate, acute, with a few well-marked, spreading teeth towards the \pm attenuate base, petiolate, the upper smaller, subsessile and similarly toothed, or linear-lanceolate, subentire; all *glabrescent* or with scattered pilose hairs on the upper surface, and more pilose beneath, with ciliate margins and villous petioles. *Inflorescence* paniculate-corymbose, 3–6-*headed*, usually shortly branched, the peduncles floccose with spreading pilose and some shorter glandular hairs. *Heads of medium size*, rather broad and rounded below. *Phyllaries* (porrect?) in bud, *olive-green*, the inner with paler margins, lanceolate-subulate, subacute, sparingly floccose (chiefly towards the base) and senescent, *with many long, pale pilose and a few, short dark glandular hairs*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 4 mm. long.

This plant has not been separated hitherto from *H. maculatum* Sm. although it has been long known that the British specimens so named are not all identical. Its points of distinction are its less hirsute foliage, smaller panicle of rather larger heads, and especially the different clothing of the peduncles and phyllaries. It might be expected that, as a Sussex native plant, it could be identified with one of the numerous allied forms of the French flora, but it has not been possible to match it. It seems most closely to resemble *H. asperatum* Jord., but this, like the other allied French forms, has much more glandular and less pilose heads.

It is thought suitable to dedicate this plant to the late Rev. John Roffey, who worked diligently at this genus during the last years of his life and was aware of the difference between this plant and true *H. maculatum* Sm.

There is an allusion to this species in Ray's *Historia*, v. 1 (1686) under *H. murorum folio pilosissimo*—'In Sussexiae sylvis prope Cuckfield vicum folio pulchris maculis notato observavi'. *H. Roffeyanum* still grows about Cuckfield.

Distribution.—13. W. Sussex: Chichester (Marshall). Warninglid (Wallace).
14. E. Sussex: Lindfield (Standen).

Endemic.

155. *HIERACIUM SURREJANUM* F. J. Hanbury in Journ. Bot. xxxii. 230 (1894); in Bab. Man. ed. 9, 258 (1904); Williams, l. c. 131 (1902); W. R. Lint. Brit. Hier. 56 (1905); *H. subramosum* subsp. *surrejanum* Zahn, l. c. 467 (1921).

Exsicc.—Linton no. 147 (Hindhead), in Hb. Mus. Brit.

Stem 30–60 cm. high, *slender*, ± reddish below, pilose (densely below), becoming very floccose above. *Radical* leaves normally few, *light green*, ascending; the primordial, when produced, small, subrotund-oval, rounded-obtuse-mucronulate, remotely denticulate, abruptly narrowed below to long, slender petioles; the later *oval to oblong*, obtuse-mucronulate, remotely denticulate to *shallowly sinuate-dentate*, chiefly towards the abruptly contracted base; *stem-leaves* 2–5, the lowest petiolate, resembling the inner basal but more sharply toothed, the upper ovate-lanceolate to lanceolate, acute, slightly toothed below, becoming sessile; all with ± numerous *pilose* hairs on both surfaces, the margins shortly ciliate and the normally long petioles villous. *Inflorescence* paniculate-corymbose, sometimes with a long lower branch, 2–8(–20, cult.)-headed, the erect-spreading peduncles densely floccose with ± numerous long, spreading pilose and sometimes also glandular hairs. *Heads* of *medium size or rather small*, rounded below. *Phyllaries* incumbent in bud, *dark or dull green*, linear-oblong, obtuse, floccose chiefly about the base, sparingly senescent, with ± numerous *dark-based pilose* and *shorter, unequal, dark glandular hairs*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3.25 mm. long.

β. *megalodon* Linton ex Hanb. in Bab. Man. ed. 9, 259 (1904); W. R. Lint. l. c. (1905); *H. subramosum* subsp. *surrejanum* var. *megalodon* Zahn, l. c. (1921).

Exsicc.—Linton no. 148 (Witley); Marshall nos. 2130, 2131 and 2687; all in Hb. Mus. Brit.

Stem pilose throughout. Inner radical leaves more deeply sinuate-dentate; lower stem-leaves deeply and irregularly sinuate-dentate with some sharp lower teeth. Inflorescence sub-20-headed. Peduncles and phyllaries with much pilose hair. Otherwise like the type.

This plant, well marked by its slender habit and relatively broad, obtuse foliage, was placed by W. R. Linton in his group *Sub-Vulgata*, but it is a definitely cauligerous species and is better regarded as a member of the *Eu-Vulgata*.

At Brook Rocks, near Witley, varying forms occur, apparently connecting var. *megalodon* with the typical species.

The French *H. vulgatum* var. *asperatum* (Sudre), as represented in the exsiccata Sudre Hb. Hier. iii. 122, is closely allied to *H. surrejanum*.

Distribution.—13. W. Sussex: Bedham Hill (Hall). 17. Surrey: Hindhead (Marshall). Witley! 35. Monmouth: Wyndeliff! 36. Hereford: Kerne Bridge (Bickham). 49. Carnarvon: Capel Curig!

var. *megalodon*.

12. N. Hants: Fleet (Marshall). 13. W. Sussex: Fittleworth (Marshall). 17. Surrey: Witley (Marshall).

Endemic.

156. *HIERACIUM MEGAPODIUM* Dahlstedt in Bot. Exch. Club (B. I.) Report, viii. pt. 1, 29 (1927).

Icon.—B. E. C. Report, viii. pl. 1.

Exsicc.—Druce, Ashdown Forest, 1926, in Hb. Druce. Pugsley, Langton, 1943, in Hb. Pugsley.

Stem 40–70 cm. high, ± *slender*, striate, sometimes tinted with purplish below, long-pilose towards the base, becoming glabrescent and ± floccose upwards. *Leaves*

dull green, occasionally purplish beneath; *radical* not numerous, primordial oval-obovate, rounded-obtuse, obscurely denticulate, the later \pm oval, subobtuse-mucronulate to subacute, *finely sinuate-dentate with spreading teeth, shortly narrowed below to long petioles*; *cauline* 2-3, the *lowest large*, oval to elliptic, subacute, denticulate towards the apex, becoming \pm *coarsely sinuate-dentate* with spreading, rather obtuse, apiculate teeth towards the \pm abruptly contracted base, with short to long, winged petiole, the upper smaller, more ovate, similarly toothed, subsessile to sessile; all *sparingly and shortly pilose* on both surfaces or glabrescent above, the *cauline* also \pm floccose beneath, margins ciliate. *Inflorescence* laxly paniculate-corymbose, 10-25-headed, *with long, slender, suberect branches*, sometimes also from the leaf-axils, *far exceeding the usually short accladium*; peduncles floccose, with few to many long, spreading pilose and shorter, fine glandular hairs. *Heads rather small*, rounded below. *Phyllaries* incumbent in bud, not numerous, *olive-green* (the inner paler), linear-lanceolate, obtuse to subacute, slightly floccose below, *with rather dense, fine, dark glandular mixed with few to many longer, dark-based pilose hairs*. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3 mm. long.

This hawkweed is characterized by relatively broad subobtuse and bluntly toothed leaves borne on long petioles, and a long inflorescence far overtopping the more or less short accladium. Its foliage recalls that of *H. surrejanum* and *H. subamplifolium* though somewhat less broad, while its flower-heads resemble those of *H. neopinnatifidum*. From each of these it is distinguishable by its elongate inflorescence. The plant up to the present has been known only from two (but adequate) sheets in Herb. Druce at Oxford, which were referred to Dahlstedt, who described it as a new species as shown above. One sheet was also sent to Zahn, who regarded the plant as a new subspecies of *H. diaphanoides* Lindbg. and suggested its identity with var. *apiculatum* Linton. This suggestion is untenable in view of the blunt and long-petiolate foliage, and the pilose clothing of the peduncles and phyllaries. In 1943 I discovered the plant in some quantity near Langton, in West Kent, and a fine series of specimens was secured.

Distribution.—14. E. Sussex: Ashdown Forest (Druce). 16. W. Kent: Langton!

Endemic.

157. *HIERACIUM SUBAMPLIFOLIUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. vulgatum var. *amplifolium* Ley in Journ. Bot. xxxviii. 6 (1900); Williams, l. c. 155 (1902); *H. sciaphilum* var. *amplifolium* W. R. Lint. Brit. Hier. 68 (1905); *H. vulgatum* subsp. *subamplifolium* Zahn, l. c. 368 (1921); non *H. amplifolium* Arv.-Touv. et Ravaud (1881).

Exsicc.—Linton no. 145 (Great Doward); Riddelsdell, Oxenhall, 1909; both in Hb. Mus. Brit.

Stem 50-100 cm. high, *robust*, striate, \pm densely pilose with long, whitish hairs below, becoming floccose and scaberulous, with scattered dark-based pilose hairs above. *Radical leaves* (sometimes few) *light green, large, oval or oblong* to oblong-lanceolate, rounded-obtuse-mucronulate to acute, *denticulate to sinuate-dentate* with very shallow teeth (rarely sharply toothed), abruptly narrowed below or shortly cuneate-based; *stem-leaves* 3-5, *distant*, the lower lanceolate or elliptic-lanceolate, acute, with sharp, ascending teeth, \pm shortly contracted below and subpetiolate, the upper similar, becoming smaller and sessile; all *pilose* on both surfaces or occasionally glabrescent above, with ciliate margins and villous petioles. *Inflorescence* paniculate-corymbose, 5-25(-40, cult.)-headed, with long, erect-spreading lower branches often exceeding the accladium, peduncles floccose with \pm numerous dark glandular and pilose hairs. *Heads of medium size to rather large*, rounded or subtruncate below,

Phyllaries incumbent in bud, *olive-green*, linear-lanceolate, subacute, sparingly floccose below and slightly senescent, *with many dark glandular and some whitish, dark-based pilose hairs*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits sharply subulate-dentate. Achenes blackish, about 3.5 mm. long.

This is a distinct species remarkable for its tall, robust habit, with distant cauline leaves, those of the basal rosette mostly very obtuse and but little toothed. The clothing of the heads is a mixture of dark glandular and white, dark-based pilose hairs, the former generally predominating.

A specimen of this species from Boughrood, Radnor, was determined by Zahn in 1931 as *H. maculatum* Sm. subsp. *Pollichiae* Sch.-Bip., and another dwarf example from Ross, Hereford, as *H. maculatum* Sm. subsp. *asperatum* (Jord.) f. *immaculatum* Zahn (Report B. E. C. ix. pt. v., p. 561 (1932)).

Distribution.—13. W. Sussex : Bexley Hill Common (Barton). 33. E. Glo'ster : Birdlip (Riddelsdell). 34. W. Glo'ster : Oxenhall Wood (Riddelsdell). Symond's Yat (Ley). 35. Monmouth : Tintern (Bickham). Wyndcliff (Marshall). 36. Hereford : Great Doward ! Kerne Bridge (Riddelsdell). 41. Glamorgan : Aberdare, etc. (Riddelsdell). 42. Brecon : Aberclydach (Ley). 43. Radnor : Boughrood (Druce). 44. Carmarthen : Ammanford (Ley).

Endemic.

158. *HIERACTIUM SUBMINUTIDENS* (Zahn) Pugsley in Journ. Bot. lxxix. 197 (1941).

H. caesium subsp. *Adlerzii* var. *subminutidens* Zahn, l. c. 450 (1921) ; *H. Adlerzii* Hanb. in Journ. Bot. xxxii. 229 (1894) ; in Bab. Man. ed. 9, 255 (1904) ; W. R. Lint. Brit. Hier. 68 (1905) ; ex parte ; non *H. murorum* subsp. *Adlerzii* Almquist ex Dahlstedt. H. Exs. ii. 85 (1889).

Exsicc.—Linton no. 67 (Llanwrtyd) partim ; Ley, Llanwrtyd, 1896 (type) ; both in Hb. Mus. Brit.

Hypophyllopodous, with stem 30–80 cm. high, robust, densely and coarsely pilose below, slightly floccose and with scattered pilose hairs above. *Radical leaves few* (2–3), often wanting or withered at time of flowering, *deep green* sometimes tinted with purple beneath, usually *oval to elliptic-lanceolate*, obtuse-mucronate, *sinuate-denticulate*, attenuate below to a short petiole ; the *stem-leaves* above (5–7) *large* (the upper decreasing in size), elliptic-lanceolate to lanceolate, acute to acuminate, with distant denticulations or broad, spreading teeth, the upper often with 2–4 long, spreading teeth towards the base, the lowest shortly petioled and the remainder sessile ; all *with scattered pilose hairs* on both surfaces, with ciliate margins and the petioles or leaf-bases villous. *Inflorescence* paniculate-corymbose, 3–20-headed, with straight, suberect branches and peduncles exceeding the accladium, and sometimes 1–3 long, \pm leafy, erect lower branches, the peduncles floccose with \pm numerous dark-based pilose and dark glandular hairs. *Heads of medium size*, subtruncate-based. *Phyllaries porrect in bud, dark green*, rather broad, linear-oblong, obtuse, slightly floccose about the base only, *with \pm numerous* long and short, fine, *dark glandular and some pilose hairs*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3 mm. long.

A form collected by Griffiths in 1891 on the banks of the Menai Strait was reported by Hanbury (l. c.) as *H. Adlerzii* Almquist, and another plant found by Ley in 1896 at Llanwrtyd, in Brecon, was subsequently identified with it. Williams (Prodr. iv, 179) dissented from the identification of these specimens with the Swedish plant, which had been sent out by Dahlstedt in 1889 as *H. murorum* subsp. *Adlerzii* Almquist (H. Exs. ii. 85) but was omitted from the descriptions in his Bidrag (1893–4), and apparently was never described by Almquist. Zahn admits his subspecies *Adlerzii*

as a British plant, but appears to have seen only the Llanwrtyd form, which he separates from the type as a variety *subminutidens*.

The original *H. murorum* subsp. *Adlerzii* Almq. (Dahlst. H. Exs. ii. 85) is a phyllopodous plant bearing rather broad leaves with spreading basal teeth, and 1-2 stem-leaves, the lower petiolate with long, divaricate teeth about the base, and the upper lanceolate and entire. Its inflorescence shows 4-5 heads with obtuse, nearly effloccose phyllaries, clothed with more or less numerous, black-based pilose and shorter glandular hairs. Several later sets sent out by Dahlstedt, now at Kew, are exactly like it. All the material from the Menai Strait, labelled '*H. Adlerzii*', that has been examined is quite different from Dahlstedt's *exsiccatae*, and belongs either to *H. anglorum* (Ley) or to *H. vulgatum* var. *nemorosum* Lindbg. As may be seen from the above description, the Llanwrtyd form also differs essentially from Dahlstedt's plant. It is scarcely phyllopodous in habit, has numerous stem-leaves and a larger panicle of heads, in which the development of the pilose and glandular hairs is different. As it cannot be identified with any other described plant, it is treated as a separate species and located with the *Eu-Vulgata* rather than with the *Caesia*, in which *H. Adlerzii* is rightly placed by Zahn. There is excellent material of *H. subminutidens* in Herb. Hanbury (in the cover of *H. Adlerzii*).

Distribution.—42. Brecon : Llanwrtyd and Abergwesyn (Ley).

Endemic.

Series *Selaphila*. (See page 194.)

159. *HIERACIUM DIAPHANUM* Fries, Novit. Fl. Suec., ed. 1, 75 (1819); Epicr. 97 (1862); Hanb. in Journ. Bot. xxx. 131 (1892); in Bab. Man. ed. 9, 260 (1904); Dahlst. Bidrag, iii. 169 and 171 (1894); *H. diaphanum* *a pratense* Williams, l. c. 159 (1902); *H. vulgatum* subsp. *diaphanum* Zahn, l. c. 381 (1921).

Exsicc.—Fries, Hb. Norm. ii. no. 11; Lindbg. H. Sc. i. 35; Dahlst. H. Exs. ii. 77; Melvill, Prestwich, 1888, in Hb. Hanbury.

Stem 30-60 cm. high, slender, reddish about the base, pilose (chiefly below) and slightly floccose upwards with scattered dark-based pilose and fine, dark glandular hairs. *Radical leaves* few, *bluish green* and paler beneath; the primordial, when developed, oval, obtuse-mucronate, obscurely denticulate, shortly cuneate-based; the later *oblong to lanceolate*, obtuse-mucronate to acute, *glandular-denticulate* or sometimes with a few fine teeth towards the attenuate base; *stem-leaves* 2-3, the lowest lanceolate, acuminate, denticulate to dentate, attenuate below, subpetiolate, the upper smaller and narrower, \pm toothed, sessile; all *glabrescent above* and sparingly pilose (chiefly on the midrib) beneath, occasionally also \pm floccose, with ciliate margins and pilose petioles. *Inflorescence* paniculate-corymbose, 3-10(-15)-headed, with suberect branches, the peduncles floccose with \pm dense, fine, dark glandular hairs. *Heads of medium size or rather small*, short and subtruncate-based. *Phyllaries* incumbent in bud, *blackish green*, broad, linear-oblong, *obtuse*, *effloccose* and *epilose*, with numerous dark, unequal glandular hairs. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits shortly dentate. Achenes reddish black, about 3 mm. long.

The only British specimen examined that seems accurately referable to *H. diaphanum* Fr. was collected by J. Cosmo Melvill on heathery ground at Prestwich, in south-east Lancashire, and is now in Herb. Hanbury. It was named '*H. diaphanum* Fr. f.' by Lindeberg, and Elfstrand remarked on it 'Is a typical *H. diaphanum* Fr.' It is characterized by bluish green, subentire, glabrescent foliage, and a panicle of short, dark, glandular, effloccose and epilose heads.

A plant collected by Colgan and Stewart on railway banks near Inchicore, Co. Dublin, and referred to *H. sciaphilum* Uechtr., is closely related to *H. diaphanum*, differing from the typical plant chiefly in its more toothed leaves and livid styles,

The description of *H. diaphanum* in W. R. Linton's 'British Hieracia' (p. 70) is not taken from Fries's plant, but, as shown by the localities cited (excepting Durham), from the form treated below as var. *subdiaphanum* of *H. praesigne* (Zahn). A variety *glauco-virens* Dahlst. (*H. vulgatum* subsp. *subglauco-virens* Zahn) also appears in Linton's work (likewise in Williams's Prodrömus), but the British specimens seen are not identical with authentic material sent out by Dahlstedt (Hier. Exs. iii. 48 (1889)), which is allied to *H. diaphanum* but has narrower, spotted leaves and smaller, narrower heads. The Durham (Franklands Wood) specimens in Herb. Hanbury are forms of *H. cravoniense* (Hanbury).

Distribution.—59. S. Lancs. : Prestwich (Melvill).

General Distribution.—Sweden. Sudeten.

160. HIERACIUM PRAESIGNE (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. diaphanum var. *praestans* W. R. Lint. Brit. Hier. 71 (1905); *H. vulgatum* subsp. *praesigne* Zahn, l. c. 385 (1921).

Exsicc.—Linton, Chee Dale and Castleton, 1903; Oliver, Dent Dale, 1905; all in Hb. Mus. Brit.

Stem 30–60 cm. high, rather slender, purplish, pilose, chiefly about the base and at the nodes, slightly floccose above. *Radical leaves* (often few) thick, *dull dark green*, sometimes purpurascens beneath; small, primordial rarely produced, the later *oblong to elliptic-lanceolate*, \pm acute, *finely serrate to sinuate-dentate*, sometimes with coarse, spreading teeth towards the shortly cuneate base; *stem-leaves* 3–4, the lowest lanceolate, acuminate, with large, sharp, spreading teeth below, abruptly contracted to a short or rather long petiole, the upper similar but smaller and sessile, or the uppermost frequently nearly linear and subentire; all *glabrescent* on both surfaces or sparingly pilose (chiefly on the midrib beneath), with shortly ciliate margins and \pm pilose petioles. *Inflorescence* paniculate-corymbose, 5–25-headed, sometimes with long, slender lower branches, the peduncles floccose with \pm numerous dark glandular or pilose hairs. *Heads of medium size to rather large*, subtruncate-based. *Phyllaries* incumbent in bud, *blackish green*, linear-oblong (outermost rather lax and narrow), *obtuse, effloccose, with many long and short, dark glandular and sometimes some dark pilose hairs intermixed*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits shortly dentate. Achenes blackish, about 3 mm. long.

β . *subdiaphanum* var. nov.

H. diaphanum W. R. Lint. Brit. Hier. 70 (1905); non Fries, nec Dahlst., nec Zahn.

Exsicc.—Linton no. 184 (Ingleton), as *H. diaphanum* (type), in Hb. Mus. Brit.; Pugsley no. 561, in Hb. Pugsley.

Folia basin versus inciso-dentata. Acladium brevissimum, interdum \pm geminatum; pedunculi glandulosi, pilis multis longis obtecti. Involucra satis parva, inferne angustata; squamae paucae, nisi extimae latae. Aliter ut in typo.

Leaves deeply incise-dentate below. Acladium very short, sometimes \pm geminate; peduncles glandular and with many long pilose hairs. Heads rather small, narrowed below; phyllaries few and broad, except the outermost. Otherwise like the type.

H. praesigne is a well-marked species owing to its thick, dark green, sinuate foliage, and its dark and typically rather large and broad heads.

As already remarked, the variety *subdiaphanum* seems to be the plant treated by W. R. Linton as *H. diaphanum* Fr., which differs essentially in its oblong-lanceolate, denticulate foliage, its broad, short heads, and its yellow styles—features which are well shown in the exsiccata Lindeberg no. 35. *H. diaphanum* var. *stenolepis* Lindeberg, as represented by the authentic exsiccata no. 36, is equally distinct in its nearly subentire foliage, but produces larger heads that recall those of typical *H. praesigne*.

No British material has been seen that agrees with this variety *stenolepis*. Forms occur that are apparently intermediate between typical *H. praesigne* and its variety *subdiaphanum*.

A plant allied to *H. praesigne* but with yet broader heads grows at Glen Shee, in Perthshire (Marshall no. 3023), at Dalmally (Marshall no. 3529), and other Scottish Highland localities, as well as on Cross Fell, in Cumberland. This needs further investigation.

Distribution.—57. Derby : Castleton and Chee Dale (Linton). 64. M.W. Yorks : Buckden (Ley). Ingleton (Cryer). 65. N.W. Yorks : Dent Dale (Oliver). 98. Argyll : Tyndrum (Marshall).

var. *subdiaphanum*.

57. Derby : Miller's Dale ! 64. M.W. Yorks : Ingleton (Ley). Smearsett (Hanbury). Settle, Feizor and Chapel-le-Dale (R. F. Thompson). 65. N.W. Yorks : Upper Teesdale (Wilmott). 80. Roxburgh : Dryburgh (Miss Hayward). 89. E. Perth : Glen Shee (Linton).

Endemic.

161. *HIERACIUM DIAPHANOIDES* Lindeberg in Bot. Notiser, 127 (1882) ; Hanb. in Journ. Bot. xxvii. 74 (1889) ; in Bab. Man. ed. 9, 260 (1904) ; Dahlst. Bidrag, iii. 163 (1894) ; Williams, l. c. 157 (1902) ; W. R. Lint. Brit. Hier. 70 (1905) ; *H. diaphanoides* subsp. *diaphanoides* Zahn, l. c. 350 (1921) ; *H. medium* Lindeberg Hier. Scand. Exsicc. iii. 123 (1873), non Jord.

Icon.—Zahn, l. c. fig. 29.

Exsicc.—Dahlst. H. Exs. i. 86 and 87 ; Marshall no. 3736 ; Linton, Lake Ogwen, 1890 ; all in Hb. Mus. Brit. ; Dahlst. H. Sc. ii. 84, ix. 67, and x. 62, all in Hb. Kew.

Stem 30–90 cm. high, normally rather slender, pilose below, becoming floccose above with some spreading pilose and occasionally a few dark glandular hairs. *Radical leaves* few, *bright green* ; the primordial, when produced, oblong, obtuse-mucronate, denticulate, cuneate-based ; the later *oblong*, lanceolate, or more rarely elliptic, obtuse-mucronate to acute, *denticulate and ± serrate-dentate towards the attenuate base* ; *stem-leaves* (1)–2–3(–5, *ap. Zahn*), the lower lanceolate, acute, ± serrate-dentate, subsessile or with a short, winged petiole, the upper smaller, toothed, sessile, becoming subentire and bractlike ; all ± *pilose* on both surfaces, with ciliate margins and the normally short petioles ± *villous*. *Inflorescence* paniculate-corymbose, usually with short, suberect, branches, 3–10-headed, the peduncles floccose (sometimes sparingly), with numerous dark glandular and sometimes a few pilose hairs. *Heads rather small, narrow*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-subulate, *subacute, effloccose* or slightly floccose about the base, *with ± dense, unequal, fine, dark glandular hairs and occasionally some dark pilose hairs* intermixed. Ligules glabrous-tipped. Styles ± *livid*. Margins of receptacle-pits shortly dentate. Achenes blackish, 2.5–3.25 mm. long.

β. *apiculatum* Linton in Journ. Bot. xxxi. 198 (1893) ; Hanb. in Bab. Man. ed. 9, 260 (1904) ; W. R. Lint. Brit. Hier. 70 (1905) ; *H. diaphanoides* subsp. *diaphanoides* var. *apiculatum* Zahn, l. c. 350 (1921).

Exsicc.—Linton no. 43 (Clova) ; W. R. Linton, Glen Shee, 1896 ; both in Hb. Mus. Brit.

Radical leaves mostly subacute, apiculate, long-attenuate below, the innermost sometimes coarsely toothed. Inflorescence rather lax, sometimes with a long lower branch, the peduncles densely clothed with dark glandular and some pilose hairs. Heads of moderate size, with obtuse and slightly senescent phyllaries. Otherwise like the type.

H. diaphanoides is a distinct and rather handsome plant with narrow, bright green foliage and narrow, velvety black heads.

A plant collected by W. R. Linton near Bethesda, Carnarvonshire, was described by Ley in Journ. Bot. xlv. p. 112 (1907), under the name of *H. ornatum* Dahlst., which is allied to *H. diaphanoides*. No British examples have been seen which agree with Dahlstedt's original *exsiccata* (*H. Exs.* ii. 81), and Zahn does not admit *H. ornatum* as British. The *exsiccata* Linton no. 42 (cult.-orig. Conway) is quite abnormal *H. diaphanoides* and seems allied to *H. anglorum*.

H. megapodium Dahlst. in B. E. C. Report, viii. pt. 1, 29 (1927), based on a specimen collected by G. C. Druce in Ashdown Forest, Sussex, is stated by Druce to be identical with *H. diaphanoides* var. *apiculatum* Lint., but the specimens in Herb. Druce show it to be a different species as described above.

A plant from Lapford, North Devon, appears to have been named by Dahlstedt *H. acidodontum* Dahlst., which is treated by Zahn as a subspecies of his aggregate *H. diaphanoides*. No Devon material of this form seems to be available.

Distribution.—4. N. Devon: Alwington (Hiern). 34. W. Glo'ster: Tintern (Riddelsdell). 48. Merioneth: Tan-y-Grisiau! 49. Carnarvon: Llanberis (Marshall)! Bangor (Linton). Bettws-y-Coed! Llanfairfechan! Cwm Idwal! 50. Denbigh: Capel Garmon! 57. Derby: Chee Dale and Coombs Dale (Linton). 64. M.W. Yorks: Giggleswick (Backhouse). Ingleton (Ley). 65. N.W. Yorks: Winch Bridge! 96. E. Inverness: Rothiemurchus (Roffey). 98. Argyll: Ben Chaisteil (Marshall).

var. *apiculatum*.

89. E. Perth: Glen Shee (Linton). 90. Forfar: Clova (Linton).

General Distribution.—Scandinavia. Central Europe.

162. *HIERACIUM RECTULUM* Ley in Journ. Bot. xlviii. 327 (1910).

Exsicc.—Ley, Llangadoc, 1907, in Hb. Mus. Brit.

Stem 30–45 cm. high, rigid, striate, reddish below, pilose with long, whitish hairs towards the base and with shorter and fewer black-based hairs (with an occasional gland) above, also \pm floccose upwards. *Radical leaves* few, green, often tinted with red; the small primordial apparently wanting, the later *oblong-lanceolate*, acute, obscurely *glandular-denticulate*, or with a few very shallow teeth in the lower half, attenuate below to rather short petioles; *stem-leaves* 1–4, gradually decreasing upwards, the lowest resembling the inner basal and shortly petioled, the upper ovate-lanceolate, acuminate, sessile, or small and bractlike; all *pilose* on both surfaces or \pm glabrescent above, shortly ciliate with villous petioles. *Inflorescence* paniculate-corymbose, sometimes with a long lower branch, 3–10-headed, with \pm long aeladium, the peduncles floccose with numerous dark glandular and occasional pilose hairs. *Heads* of medium size, rounded below and subtended by a few bracteoles. *Phyllaries* (porrect) in bud, blackish green, the inner with paler margins, lanceolate-subulate, mostly subacute, sparingly floccose below, with numerous long and short, dark glandular hairs, *epilose*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits unknown. Achenes dark reddish brown, 3.5 mm. long.

This is a rare species, known only from a single station in Wales. It is related to *H. diaphanum*, but is a more pilose plant with narrower, subacute and somewhat floccose phyllaries and livid styles.

Distribution.—44. Carmarthen: Llangadoc (Ley).

Endemic.

163. *HIERACIUM PULCHRIUS* (Ley) W. R. Linton, Brit. Hier. 71 (1905); *H. sciaphilum* var. *pulchrius* Ley in Journ. Bot. xxxvii. 35 (1899); Hanb. in Bab. Man. ed. 9, 261 (1904); *H. vulgatum* subsp. *pulchrius* Zahn, l. c. 382 (1921).

Exsicc.—Linton no. 117 (Brecon Beacons); Riddelsdell, Carmarthenshire Fan, 1901; both in Hb. Mus. Brit.

Stem 30–60 cm. high. *robust*, sparingly pilose (chiefly below) and slightly floccose above with \pm numerous blackish glandular hairs. *Radical leaves* ascending, *bright green*; the primordial subrotund-oval, rounded-obtuse-mucronulate, subdenticulate, abruptly narrowed below; the later \pm *large, lanceolate-obovate to elliptic-lanceolate*, obtuse-mucronate to acute, distantly *denticulate* or with a few irregular, shallow teeth, \pm *cuneate-based*; *stem-leaves* 2–3, the lower lanceolate, acuminate, with small, distant, spreading teeth, petioled or not, the upper smaller, of similar form, sessile, or sometimes linear-lanceolate, subentire; all *sparingly pilose* on both surfaces or glabrescent above, shortly ciliate, with \pm villous petioles. *Inflorescence* paniculate-corymbose, with suberect branches, or sometimes subumbellate, 4–10-headed, the peduncles rather sparingly floccose, with dense, strong, blackish glandular hairs. *Heads of medium size to rather large*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-oblong, mostly obtuse, *slightly floccose* about the base, *with dense, strong, long and short, black glandular hairs, epilose*. Ligules golden yellow, glabrous-tipped. Styles fuscous. Margins of receptacle-pits sharply subulate-dentate. Achenes blackish, about 3.5 mm. long.

This is another handsome hawkweed which Ley considered intermediate between *H. Lachenalii* Gmel. and *H. pulcherrimum* (Hanb.) of the Snowdonian mountains. It resembles the latter to some extent in its compact panicle of golden heads with blackish, densely glandular involucre, but its aggregate of characters clearly brings it within the Subsection *Eu-Vulgata*.

Distribution.—42. Brecon : Beacons and Craig Gledsiau (Ley). 44. Carmarthen : Fanfechan (Ley).

Endemic.

164. *HIERACIUM SUBMUTABILE* (Zahn) Pugsley in Journ. Bot. lxxix. 197 (1941).

H. vulgatum var. *mutabile* Ley in Journ. Bot. xxxviii. 5 (1900); *H. acroleucum* var. *mutabile* W. R. Lint. Brit. Hier. 65 (1905); *H. mutabile* Ley in Journ. Bot. xlvii. 48 (1909), non F. Schultz, Fl. Pfalz (1845); *H. vulgatum* subsp. *argillaceum* var. *submutabile* Zahn, l. c. 365 (1921).

Exsicc.—Ley, Pontfaen, Brecon, 1906; Riddelsdell, Llangammarch, 1907; Linton no. 146 (Cerrig Haffys); Ley, Nant Melyn, 1897; all in Hb. Mus. Brit.

Stem 30–60(–90, cult.) cm. high, pilose, chiefly about the base, becoming floccose with scattered fine, dark glandular hairs above. *Radical leaves* generally *small*, spreading in a rosette, *greyish green, oblong to elliptic- or ovate-lanceolate*, obtuse-mucronulate to acute, *denticulate* or with a few, shallow, sinuate-dentate teeth (sometimes sharper in cultivation), shortly attenuate below to short, \pm winged petioles; *stem-leaves* 1–4 (commonly 2), the lowest (placed low on the stem) spreading, elliptic-lanceolate, acuminate, with a few sharp teeth, subpetiolate, the second often similar but smaller, the upper lanceolate to linear-lanceolate, denticulate, or \pm bract-like; all *pilose* on both surfaces *with rather stiff hairs*, strongly ciliate and with villous petioles. *Inflorescence* racemose- to paniculate-corymbose, 3–12(–30, cult.)-headed, sometimes with one or more long lower branches, the straight, suberect peduncles floccose, with many fine, dark glandular hairs. *Heads of medium size, short and broad*, rounded below. *Phyllaries* incumbent in bud, *dark green* (sometimes purple-tipped), rather broad, lanceolate-subulate, mostly obtuse, *sparingly floccose, with many fine, unequal, dark glandular hairs, epilose*. Ligules glabrous-tipped. Styles

fuscous or livid. Margins of receptacle-pits finely subulate-dentate. Achenes purplish black, about 3 mm. long.

H. submutabile is a very distinct species characterized by a small, spreading rosette of roughly hirsute leaves, a long, nearly naked stem with few and small leaves usually placed low, and a panicle, often lax, of rather short, dark heads clothed with fine, dark glandular hairs.

The specimens of Linton's set of exsiccatae no. 146, from Builth and from Nant Francon (as *H. vulgatum* var. *mutabile*), do not belong to this species but to *H. strumosum* Ley.

H. reclinatum Almq., included in Druce's Plant List, is apparently based on a specimen in his herbarium (near Llandecwym, Merioneth, 1919) on which Dahlstedt reported 'Belongs to *Vulgata*; somewhat allied to *H. reclinatum* Almq.' The specimen is probably *H. submutabile*.

Distribution.—41. Glamorgan: Llwydeod (Riddelsdell). 42. Brecon: Cerrig Haffys (Linton). Llangammarch (Ley). Cellwen (Riddelsdell). Upper Tawe Glen (Barton). Llanwrtyd! 44. Carmarthen: Nant Melyn (Ley). 46. Cardigan: Cwm Twrch (Ley). 55. Leicester: Mountsorrel (Foord-Kelcey).

Endemic.

165. *HIERACIUM DAEDALOLEPIOIDES* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. vulgatum var. *daedalolepium* Hanb. in Bab. Man. ed. 9, 258 (1904); *H. acroleucum* var. *daedalolepium* W. R. Lint. Brit. Hier. 64 (1905), non Dahlst. Bidrag, iii. 71 (1894); *H. vulgatum* subsp. *daedalolepioides* Zahn, l. c. 372 (1921).

Exsicc.—Linton no. 115 (Bethesda); Barton, Arthog and Barmouth, 1915; all in Hb. Mus. Brit.; Pugsley, Tan-y-Bwlch, 1925, in Hb. Pugsley.

Stem 20–60 cm. high, slender, ±purplish-tinted below, pilose (chiefly towards the base and at the nodes), becoming flocculose above. *Radical leaves* often numerous and usually small, bright to caesious green; the primordial oval to obovate, obtuse-mucronulate, subentire, abruptly narrowed below; the later *elliptic-lanceolate* to lanceolate, acute, *denticulate or with distant, shallow, spreading teeth*, cuneate-based with ±short petioles; *stem-leaves* 3–5, elliptic-lanceolate to lanceolate, acuminate, denticulate or with a few irregular teeth, the lower attenuate below but semi-amplexicaul, the upper broad-based and sessile; all *with numerous rather short pilose hairs* on both surfaces, the margins ciliate and the petioles ±villous. *Inflorescence* paniculate-corymbose, 4–10-headed, with slender, suberect branches generally exceeding the accladium, the peduncles flocculose with many fine, dark glandular and a few pilose hairs intermixed. *Heads* small, rather narrow, scarcely rounded below. *Phyllaries* incumbent in bud, dull dark green, linear-lanceolate, mostly acute, slightly floccose about the base, with ±dense, fine, long and short, dark glandular hairs, almost *epilose*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes reddish black, about 2.5 mm. long.

This plant was regarded by Messrs. Linton as Dahlstedt's variety *daedalolepium* of *H. acroleucum* Stenstr. and was sent out in their set of exsiccatae under that name (no. 115). Zahn examined a sheet of this set (from Bethesda), and while admitting Dahlstedt's variety as a British plant, considered Linton's Bethesda specimen distinct from any form of *H. acroleucum* and separated it as a new subspecies, *H. daedalolepioides*, under *H. vulgatum*.

Zahn appears to be justified in this treatment on account of the predominantly glandular clothing of the phyllaries in the Bethesda plant. *H. daedalolepioides*, however, is a rather obscure and difficult species, approaching on one side forms of *H. anglorum* (Ley) and on the other *H. diaphanoides*. It may usually be distinguished

from the latter without much difficulty through the narrower, brighter green foliage and the blacker, more strongly glandular heads of *H. diaphanoides*. But the line of demarcation between it and *H. anglorum* is none too clear, and some, especially Welsh specimens referred to *H. daedalolepioides* have the aspect of rather slender, weak or narrow-leaved examples of *H. anglorum*.

Distribution.—39. Stafford : Mow Cop (Painter). 41. Glamorgan : Glyn Neath (Ley). Cwmdare (Riddelsdell). 42. Brecon : Builth Wells ! 48. Merioneth : Tyny-Groes, Arthog and Barmouth (Barton). Tan-y-Bwlch ! Festiniog (Ley). Llanfair (Linton). 49. Carnarvon : Conway ! Bethesda (Linton). 55. Leicester : Swithland (Preston). 69. Westmorland : Colwith Bridge (Linton). Langdale (Ley).

General Distribution.—Thüringen, Germany (ap. Zahn).

166. *HIERACIUM ANGLORUM* (Ley) Pugsley in Journ. Bot. lxxix. 197 (1941).

H. scanicum var. *anglorum* Ley in Journ. Bot. xlvii. 49 (1909) ; non *H. pinnatifidum* subsp. *scanicum* Dahlst. Bidrag, iii. 88 (1894).

Exsicc.—Linton no. 42 (cult., orig. Conway) ; Linton, Penrhyn, 1890 (type) ; Riddelsdell, Neddfechan Glen, 1911 ; Roffey, Craig Breidden, 1921 ; all in Hb. Mus. Brit.

Stem 30–80 cm. high, *normally robust*, densely long-pilose below and at the nodes, with numerous spreading pilose hairs throughout, becoming slightly floccose and sometimes also glandular upwards. *Radical leaves pale or greyish green*, sometimes few (2–3), sometimes several, forming a spreading rosette, all *oblong to oblong- or ovate-lanceolate*, obtuse-mucronate to acute, \pm deeply *sinuate-serrate* (occasionally with blunt teeth), the lower teeth sometimes small and the leaf shortly cuneate-based, sometimes the lower teeth longest and the leaf-base subtruncate ; *stem-leaves* 3–5(–9), the lowest ovate-lanceolate, acuminate, with \pm long, spreading basal teeth and a short, winged petiole, the upper (decreasing in size) lanceolate, acuminate, sharply toothed or lacinate-dentate with spreading teeth towards the sessile base ; all *pilose* on both surfaces with ciliate margins, the petioles (generally short) villous. *Inflorescence* paniculate-corymbose, 3–20(–40)-headed, with erect-spreading branches generally exceeding the acladium, and sometimes long lower (even leafy) branches from the axils of the stem-leaves, the upper part of the panicle in strong plants *often subumbellate* ; the peduncles \pm floccose, with numerous or sometimes dense, dark glandular hairs, generally epilose or nearly so. *Heads rather small*, sometimes \pm narrow, rounded below. *Phyllaries* incumbent in bud, \pm blackish green, lanceolate-subulate, mostly acute, *sparingly floccose* towards the base, with \pm dense, *unequal, dark glandular hairs, epilose or rarely with a few solitary simple hairs*. Ligules glabrous-tipped. Styles light livid. Margins of receptacle-pits shortly subulate-dentate. Achenes blackish, small, 2.5–3 mm. long.

H. anglorum was formerly confused with *H. sciaphilum* Uechtr., *H. diaphanoides* Lindbg., *H. irriguum* Fr. and *H. Adlerzii* Almq., and was identified by Ley with *H. scanicum* Dahlst. in 1907 (Journ. Bot. xlv. 111.). In 1909 Ley (l. c. supra) recognized that the British plant did not exactly match the Scandinavian *H. scanicum* and proposed to distinguish it as a variety *anglorum*. An examination of the extensive material in Herb. Mus. Brit. shows that *H. anglorum* is a distinct though variable species, which is widely spread over England and Wales. It differs from *H. sciaphilum* (*H. Lachenalii* Gmel.) in its broader, deeply cut upper stem-leaves, and its smaller, darker and less floccose heads. Its broader foliage, with more stem-leaves, and its larger panicle of paler heads separate it from *H. diaphanoides*, and the relatively broad, hirsute foliage, with the more or less densely glandular involucres, from *H. irriguum*. *H. Adlerzii* differs by its fewer, though similarly cut stem-leaves and its

small panicle of larger but much less densely glandular heads. The Scandinavian *H. scanicum* Dahlst. is a slender plant with few basal leaves, these and the cauline lanceolate with long-attenuate bases; and its heads, on an average, develop shorter and finer glandular indumentum. No British specimens have been seen referable to this or to *H. irriguum* as understood by Dahlstedt and Zahn.

In 1907 (l. c.) two further species, *H. cacuminatum* Dahlst. and *H. barbareaefolium* Lönnr., were reported by Ley as British. These two plants are represented by good Scandinavian specimens in Herb. Kew (Dahlst. H. Sc. xi. 67 and xv. 58 (*H. cacuminatum*), and H. Sc. xii. 82 (*H. barbareaefolium*), from which their essential characters can be well judged. None of the numerous British specimens referred to these species by Ley and others agree with this authentic material; they all possess definitely more pilose foliage as well as much more densely glandular heads and peduncles, and seem referable partly to *H. anglorum* and partly to *H. Lachenalii*. A robust form collected by Riddelsdell in several stations in Glamorgan and named *H. barbareaefolium* Lönnr. is characterized by notably petiolate and shortly toothed cauline leaves, and should perhaps be distinguished as a separate variety of *H. anglorum*.

In B. E. C. Report, viii. pt. 1, p. 29 (1927), a plant from Ysptyty Cynfyn, Cardigan, is stated to have been named *H. scotophyllum* Omang by Dahlstedt. The specimen (in Herb. Druce) is *H. anglorum*. This appears to be shown in the 'Plant List' as *H. scotophyllum* (Vent.) Z. (*H. scotophyllum* Vukot.)

The specimens from Beaumaris, Anglesey, recorded in B. E. C. Report, ix. pt. 3, p. 272 (1931), as *H. maculatum* subsp. *divisum* (Jord.) var. *genuinum* Sudre, on the authority of Zahn, likewise belong to *H. anglorum*.

It has already been pointed out, under *H. dissimile*, that the Devon plants identified with *H. porrigens* (Almq.) belong partly to this species and partly to *H. Lachenalii*.

Distribution.—4. N. Devon: Lynmouth! N. Molton (Hiern). 13. W. Sussex: Petworth and Lodsworth (Barton). 16. W. Kent: Beckenham (Playfair). 17. Surrey: Putney Heath! Addington (W. F. Miller). 20. Herts: Hitchin (Little). 21. Middlesex: Uxbridge (Loydell). 22. Berks: Boar's Hill (Riddelsdell). 27. E. Norfolk: Holt (Fisher). Swafield (Linton). 28. W. Norfolk: Gaywood (Wardale). 30. Bedford: Cleyhill (McLaren). 33. E. Glo'ster: Harefield (Riddelsdell). 34. W. Glo'ster: Symond's Yat (Ley). Mangotsfield (Miss Roper). 35. Monmouth: Govilon (Ley). Wyndcliff! Machen (Riddelsdell). 36. Hereford: Great Doward! 38. Warwick: Hill Wooton (Bromwich). 39. Stafford: Alstonfield (Purchas). Wetton (Hanbury). 40. Shropshire: Marshbrook (Ley). Bridgnorth (Allen). 41. Glamorgan: Bridgend, Aberdare and Craig-y-llyn (Riddelsdell). Neath Abbey (Roffey). 42. Brecon: Hermon Chapel (Riddelsdell). Dyffryn Cwannon (Hanbury). Upper Tawe (Ley). 43. Radnor: Allt Goch (Hanbury). 44. Carmarthen: Burry Port! 46. Cardigan: Llanilar (Painter). Ystrad-ffin (Ley). 47. Montgomery: Tal-y-llyn (Mennell). Craig Breidden (Roffey). 48. Merioneth: Barmouth (Mason). Arthog (Barton). 49. Carnarvon: Bethesda (Linton). Cwm Idwal (Ley). Great Orme's Head! 50. Denbigh: Llangollen (Ley). 52. Anglesea: Garth Ferry! 53. S. Lincs: Norton Disney (Fisher). 54. N. Lincs: Market Rasen (Fisher). 55. Leicester: Moira (Horwood). 56. Notts: Rainworth (Fisher). 57. Derby: Monsal Dale (Linton). Wirksworth (Headly). 58. Cheshire: Congleton (White). 60. W. Lancs: Halton (Wilson). 62. N.E. Yorks: Sutton Bank (Foggitt). 64. M.W. Yorks: Leeds and Ingleton (Cryer). Beezley Beck (Linton). Twistleton (Riddelsdell). 69. Westmorland: Brathay and Coniston (Ley). Skelwith (Roffey). Far Easedale (Fox).

Ireland.—14. Leix: Erril (Phillips). 19. Kildare: Curragh (Praeger). 38. Down: Saintfield (Waddell).

Endemic.

167. *HIERACIUM TUNBRIDGENSE* sp. nov.

Exsicc.—Pugsley no. 814 (type); C. E. Britton no. 4008 (Worms Heath); both in Hb. Pugsley.

Caulis (25–)30–70(–90) cm., \pm *robustus*, striatus, pilis patulis praesertim basin versus hirsutus, superne satis floccosus. *Folia dilute viridia*; *radicalia* nunc in rosulam bene evolutam producta nunc subnulla, exteriora ovalia vel elliptica ad ovato-elliptica, obtuso-mucronata, remote denticulata, in petiolum \pm gracilem breviter vel abrupte contracta, interiora (saepe magna) *elliptico- ad oblongo-lanceolata*, acuta ad acuminata, *dentibus inaequalibus argutis curvatisve* (nonnunquam denticulis immixtis) plurimum in dimidio inferiore *munita* (tenuius dentata vel etiam denticulata in exemplaribus depauperatis), in petiolum gracilem saepius longum angustata; *caulina* (2–)4–6, inferiora petiolata, elliptico- ad ovato-lanceolata, acuminata, vulgo basin breviter cuneatam versus dentibus crassis, inaequalibus, argutis, porrectis vel patulis; summa saepissime angustiora, subsessilia, \pm pinnatifida ad subintegra; omnia utrinque *pilosa* vel interdum superne glabrescentia, marginibus ciliatis petiolisque villosis. *Anthela* laxe paniculato-corymbosa, (2–)5–15(–20)-*cephala*, *ramis longis gracilibus suberectis*, nonnunquam e foliorum superiorum axillis ortis, *acladium breve saepius multo superantibus*, pedunculis gracilibus \pm flocculosis sparsim tenuiter glandulosis. *Involucra parva*, basi subtruncata. *Squamae olivaceae*, interiores pallide marginatae, lineari-lanceolatae, subacutae, *basin versus floccosae, glandulis numerosis inaequalibus breviusculis tenuibus obscuris obiectae, epilosae*. Ligulae \pm radiant, apice glabrae. Styli sublutei. Alveoli receptaculi margine inciso-dentati.

Stem (25–)30–70(–90) cm. high, \pm *robust*, striate, pilose with spreading hairs, chiefly towards the base, becoming somewhat floccose above. *Leaves light green*; the *radical* sometimes forming a well-developed rosette, sometimes almost wanting, the outer oval or elliptic to ovate-elliptic, obtuse-mucronate, remotely denticulate, shortly or abruptly narrowed below to \pm slender petioles, the inner (often large) *elliptic- to oblong-lanceolate*, acute to acuminate, *with unequal, sharp or cusped teeth* (sometimes interspersed with denticulations) mostly in the lower half (more finely toothed or even denticulate only in weak examples), narrowed below to slender, generally long petioles; *cauline* (2–)4–6, the lower petiolate, elliptic- to ovate-lanceolate, acuminate, usually with coarse, irregular, sharp, ascending or spreading teeth towards the \pm shortly cuneate base; the uppermost generally narrower, subsessile, \pm pinnatifid to subentire; all *pilose* on both surfaces or sometimes glabrescent above, with ciliate margins and villous petioles. *Inflorescence* laxly paniculate-corymbose, (2–)5–15(–20)-*headed, with long, slender, suberect branches*, sometimes from the upper leaf-axils, *often much exceeding the short acladium*; the slender peduncles \pm flocculose with scattered fine glandular hairs. *Heads small*, subtruncate-based. *Phyllaries* incumbent in bud, *olive-green* (the inner with paler margins), linear-lanceolate, subacute, *floccose towards the base, with numerous unequal, rather short, fine, dark glandular hairs, epilose*. Ligules \pm radiant, glabrous-tipped. Styles yellowish. Margins of receptacle-pits incise-dentate. Achenes purplish black, about 3 mm. long.

This hawkweed appears to have been first gathered by Hilton and Salmon at Groombridge, near Tunbridge Wells, and was referred to *H. pinnatifidum* Lönner. by Linton. It was also collected in 1904 by the brothers Groves at Farningham, in West Kent, but the specimens remained unnamed in their herbarium. Further material of the same form from Worms Heath, Surrey, was sent to the Botanical Exchange Club (B. I.) by Mr. C. E. Britton in 1932 as *H. acuminatum* Jord. I have recently found that it occurs on hedgebanks in various localities round Tunbridge Wells.

The plant is somewhat intermediate in characters between *H. Lachenalii* Gmel. and *H. neopinnatifidum*. Its foliage resembles that of the former, but is often narrower and more deeply toothed. Its flower-heads are not only smaller and paler, with a subtruncate base, but are much less densely floccose and glandular and in

well-grown plants they are borne in a long, lax, slender-branched panicle that is characteristic. *H. neopinnatifidum* may be distinguished, not only by the presence of a mixture of pilose and glandular hairs on the phyllaries, but by its less numerous and rather narrower stem-leaves. *H. anglorum* differs in its sinuate-dentate leaf-cutting and in its subumbellate panicle of darker heads. The long, lax panicle, far exceeding the short acladium, recalls *H. megapodium* Dahlst., which, however, is readily separable by the mixed indumentum of its phyllaries. As the new plant evidently inhabits a considerable area in south-east England and cannot otherwise be identified, it is described as a distinct species and named after the locality where it seems chiefly to abound. It is a later flowering species than *H. Lachenalii*, not blooming until July.

Distribution.—14. E. Sussex : Groombridge (Hilton and Salmon). Cousley Wood (Wallis). Frant ! 16. W. Kent : Farningham (Groves). Pembury ! Goudhurst (Hanbury). 17. Surrey : Worms Heath (C. E. Britton) !

Endemic.

168. *HIERACIUM LACHENALII* Gmelin, Fl. Badensis iii. 322 (1808) ; *H. silvaticum* Sm. Eng. Bot. 2031 (1809), non Gouan ; *H. argillaceum* Jord. Cat. Gren. 17 (1849) ? ; *H. vulgatum* var. *genuinum* Syme, E. B. ed. 3, v. 197 (1866) ; *H. vulgatum* var. *sciaphilum* Uechtr. in Baenitz Hb. Eur. no. 3032 (1877) ; Linton in Journ. Bot. xxxi. 197 (1893) ; Williams, l. c. 155 (1902) ; *H. sciaphilum* Hanb. in Bab. Man. ed. 9, 260 (1904) ; W. R. Lint. Brit. Hier. 68 (1905), ex parte ; *H. vulgatum* subsp. *Lachenalii* Zahn, l. c. 362 (1921).

Icon.—Eng. Bot. t. 2031, as *H. silvaticum* (E. B. ed. 3, 850). Pl. 9, fig. b.

Exsicc.—Wiesbaur, Kalksburg bei Wien, 1883, in Hb. Kew ; Linton no. 22 (Dovedale, cult. and Clifton) ; Linton, Snelston, 1887, and Woburn Sands, 1895 ; Riddelsdell, Wootton-under-Edge, 1909, and Hook Norton, 1920 ; in Hb. Mus. Brit. (all as *H. sciaphilum*).

Stem 30–100 cm. high, *robust*, pilose, especially below, often scaberulous, floccose and with \pm numerous dark glandular hairs above. *Radical leaves* usually few but occasionally numerous, *deep or light green*, sometimes suffused with red in exposure, *elliptic- or ovate-lanceolate*, acute, denticulate towards the apex, becoming \pm sharply and deeply *dentate* towards the shortly cuneate base ; *stem-leaves* (4–)5–7(–12), the lowest petiolate, ovate-lanceolate, acuminate, with sharp, spreading teeth towards the \pm cuneate base, those above smaller, becoming sessile, and the *uppermost linear-lanceolate and subentire* ; all *pilose* on both surfaces with rough hairs, the margins shortly ciliate and the generally short petioles densely pilose. *Inflorescence* paniculate-corymbose, 3–50-headed or more, often with crowded heads and long, spreading lower branches, the rather short peduncles floccose and with dense, unequal, \pm dark glandular hairs. *Heads of medium size*, becoming \pm ovate, rounded or more rarely subtruncate below. *Phyllaries* incumbent in bud, (the outer rather lax) *deep olive-green with paler margins*, linear-lanceolate, acute, *floccose* (especially below), slightly senescent, *with dense, \pm dark, strong, unequal glandular hairs, epilose* or rarely with a few solitary pilose hairs. *Ligules* (in British plants) *usually slightly pilose-tipped*. *Styles yellow or fuscous*. Margins of receptacle-pits shortly and irregularly dentate. Achenes blackish, about 3.5 mm. long.

f. nemorale forma nova.

Exsicc.—Pugsley, Mickleham, 1920 (type), in Hb. Pugsley.

Caulis humilior, gracilis, superne vix scaberulus minus glandulosus. Folia tenuia, lacte viridia, quam typi minus dentata, caulina (3–)4–5(–7). *Anthela capitulis paucioribus* (–20) *pallidioribus minor* ; *squamae nonnunquam et raro pedunculi pilis solitariis inter glandulas lutescentes immixtis obsiti. Aliter ut in typo.*

Stem lower, slender, less scaberulous and glandular above. Leaves thin, bright green, less deeply toothed than in the type, the cauline (3-)4-5(-7). Panicle smaller, with fewer (-20) and paler heads, the phyllaries sometimes and the peduncles rarely with a few pilose hairs intermixed with the yellow-headed glandular hairs. Otherwise like the type.

β. radyrense var. nov.

H. sciaphilum f. *paucifolia* Ley in litt. 1911.

Exsicc.—Riddelsdell, Radyr, 1910 (type) and 1911; both in Hb. Mus. Brit.

Folia radicalia late ovato-lanceolata, acuta, dentibus argutis patulis imparibus denticulisque immixtis praedita, dentibus infimis prope basin subtruncatam longissimis divaricatisque; caulina 2-3(-5), ovato-lanceolata, acuminata, irregulariter argute dentata, nonnunquam basin versus laciniato-dentata. Typi anthela et capitula; ligulae apice pilosae.

Radical leaves broadly ovate-lanceolate, acute, with sharp, spreading, unequal teeth interspersed with denticulations, the lowest teeth longest and divaricate about the subtruncate base; stem-leaves 2-3(-5), ovate-lanceolate, acuminate, irregularly and sharply toothed, sometimes lacinate-dentate towards the base. Inflorescence and heads of the type; ligules pilose-tipped.

γ. pseudo-porrigenes var. nov.

H. dissimile v. *porrigens* Hanb. l. c. 258 (1904); *H. porrigens* W. R. Lint. l. c. 62 (1905) ex parte, non Almqvist.

Exsicc.—Pugsley no. 596 (type) in Hb. Pugsley.

Planta habitu gracili foliis tenuibus ut in f. *memorali*. Anthela (-20-cephala) laxa, ramis pedunculisque ± longis gracilibus. Pedunculi parce glandulosi; squamae glandulis tenuioribus minus densis quamvis valde imparibus, saepissime pilis nonnullis immixtis obsitae.

Slender in habit and with flaccid foliage as in f. *memorale*. Inflorescence (-20-headed) lax, with ± long and slender branches and peduncles. Peduncles sparingly glandular; phyllaries with finer and less dense, but very unequal glandular hairs, usually with some pilose hairs intermixed.

H. Lachenalii is a common and widely distributed plant throughout England and Wales as far north as Yorkshire. Growing in a great variety of situations, it is eminently variable, perhaps even more so than *H. anglorum* and *H. vulgatum*. It is recorded by Praeger ('Botanist in Ireland', p. 515) for four Irish vice-counties, but the specimens from three of them belong to other species and that from the fourth (Tralee, coll. Scully) is probably introduced. The figure in 'English Botany' was drawn from a specimen obtained at High Beech, Epping Forest.

The variety *transiens* Ley (Journ. Bot. xlvii. 49) is not adopted, as it is not clear how the author interprets the specific type from which he separates it. *H. deductum* Sudre (*H. Jaccardii* Zahn) is admitted to the British list by Roffey (Journ. Bot. lxiii. 318) and is said to be characterized by the presence of pilose as well as glandular hairs on the peduncles and phyllaries. The exsiccata 'Sudre i. 32. *H. deductum* α. *genuinum*, Hte. Garonne', however, as represented in Herb. Mus. Brit., has the peduncles and heads densely glandular and epilose, and seems to be a good example of typical *H. Lachenalii*.

The variety *radyrense* is referred by Roffey (Journ. Bot. lxiii. 318) to *H. paucifolium* Jord., but apparently incorrectly. Jordan's species is a narrow-leaved plant approaching *H. diaphanoides*, but with the phyllaries clothed with simple as well as glandular hairs. It is not treated as British by Zahn.

It has been explained under *H. dissimile* that the North Devon plant first referred to *H. porrigens* (Almq.) appears to be a form of *H. Lachenalii*. It resembles f. *memorale*, but seems sufficiently distinct to warrant recognition as a separate variety.

There is a remarkable plant in Herb. Hanbury collected in 1894 by Hart near

the Lannan river, Kilmacrenan, Co. Donegal, which has luxuriant foliage of *Lachenalii* form and a large panicle of pilose but eglandular heads.

In the B. E. C. Report, ix. pt. 3, p. 271 (1931) *H. brevidentatum* Jord. var. nov. *multiflorum* Zahn is recorded for Huntercombe, Oxon. The solitary specimen on which this record is founded appears to be an average specimen of *H. Lachenalii* Gmel. grown in half shade. Another shade-grown specimen of *H. Lachenalii* from Sapperton, in East Gloucester, is recorded on the same page as *H. aspernatum* Jord. var. *anglicum* (Zahn). On the following page *H. arrectarium* Jord., from Cuckoo Lane, Staffs, appears. The specimen forming the basis of this record consists of three stems, with much withered foliage and very dark, partly diseased heads. This plant is possibly doubtful, but probably also a form of *H. Lachenalii*, abnormal through growing in a smoky colliery district.

Two fragmentary pieces of secondary growth from Callington, in Cornwall, are recorded in B. E. C. Report, ix. pt. 5, p. 560 (1932) as *H. Alfengrenii* Dahlst. var. *plurifolium* Zahn. There is little doubt but that these fragments likewise belong to *H. Lachenalii*.

The *Pulmonaria gallica sive aurea latifolia* of Johnson's Gerard, p. 304 (1633), which is shown by his cut to be identical with *H. exotericum*, is represented by Petiver (Cat. Pl. xiii. f. 4 (1713)) as a plant similar to *H. Lachenalii*, which is said to grow on old walls and in woods near London. This may be the origin of the confusion that so long existed between the forms of *H. murorum* and *H. vulgatum*.

Distribution.—2. E. Cornwall : Callington (Wise). 4. N. Devon : Brendon, etc. ! 5. S. Somerset : Dulverton and Porlock Weir (Marshall). 6. N. Somerset : Cheddar ! Leigh Down (White). 7. N. Wilts : Wootton Bassett (Grose). 8. S. Wilts : Compton (Tatum). 9. Dorset : Woolbridge and Edmondsham (Linton). 12. N. Hants : Highelere (Barton). E. Woodhay (A. B. Jackson). 13. W. Sussex : Pangdean (Hilton). Blackdown (Burdon). 14. E. Sussex : Dallington (Wolley-Dod). Groombridge ! 16. W. Kent : Swanley (Hanbury). Ightham (Marshall). Knockholt (Atkins). Rusthall ! 17. Surrey : Brookwood (Marshall). Mickleham ! Brook ! 18. S. Essex : Warley Common (Foster). 20. Herts : Tring ! 21. Middlesex : Harrow Weald (Trimen). 23. Oxford : Hinksey (Whitwell). Hook Norton (Riddelsdell). Nettlebed (French). Oxford ! 24. Bucks : Woburn (Linton). Beaconsfield (Druce). 25. E. Suffolk : Bentley (Brown). 26. W. Suffolk : Honington (Hind). 30. Bedford : Kingswood, etc. (Dony). 32. Northants : Ufford (Fisher). 33. E. Glo'ster : Campden (Riddelsdell). 34. W. Glo'ster : Clifton ! King's Stanley (Reader). 35. Monmouth : Llandogo (Shoolbred). 36. Hereford : Titley and Ludlow (Ley). Kerne Bridge (Riddelsdell). 37. Worcester : Malvern (Towndrow). 38. Warwick : Rugby (Linton). Coventry (Kirk). 39. Stafford : Alstonfield (Purchas). 40. Shropshire : Cardington (Ley). Nesscliffe (Leighton). 41. Glamorgan : Craig-y-llyn (Hanbury). Gowerton (Riddelsdell). 42. Brecon : Tawe Glen (Barton). Cwm Tarell (Hanbury). Erwood ! 43. Radnor : Llandrindod (Barton). Aberedw (Hanbury). Cwmhir (Painter). 44. Carmarthen : Glynhir (Ley). 46. Cardigan : Ystrad-ffin (Ley). Aberayron (Marshall). 47. Montgomery : Leighton (J. Bedford). 48. Merioneth : Dolgelly (Ridley). Cader Idris (Mennell). Arthog (Mrs. Wedgwood). 49. Carnarvon : Llanfairfechan ! Great Orme's Head ! Llanberis ! Bettws-y-Coed ! Craig Dulyn (Hanbury). 50. Denbigh : Conway Falls ! 55. Leicester : (Headly). 56. Notts : Southwell (Fisher). 57. Derby : Winkworth (Bell). Bolsover and Buxton (Linton). Repton (Painter). 58. Cheshire : Bollington (Marshall). 60. W. Lancs : Langridge (Wheldon). 62. N.E. Yorks : Hambleton (Baker). Rievaulx ! York (Backhouse). 64. M.W. Yorks : Grassington ! Stainforth ! Malham (Groves). Settle (Hanbury). 65. N.W. Yorks : Richmond ! 69. Lake Lancs : Coniston (Ley).

Ireland.—2. N. Kerry : Tralee (Scully).

var. *radyprense*.

41. Glamorgan : Radyr (Riddelsdell).

var. *pseudo-porrigens*.

4. N. Devon : Lynmouth (Hiern) !

General Distribution.—Spain. France ! Switzerland. Germany. Austria. Hungary.

169. *HIERACIUM STRUMOSUM* Ley in Journ. Bot. xlvii. 49 (1909) ; *H. sciaphilum* var. *strumosum* Ley ex W. R. Lint. Brit. Hier. 68 (1905).

Exsicc.—Ley, Mellte Glen, 1900, Grwyne Valley and Pont Esgob, Hereford, 1903, and Stroud, 1909 ; all in Hb. Mus. Brit.

Stem 15–60(–90, cult.) cm. high, *slender*, pilose (especially below), becoming \pm floccose above, and often with occasional fine glandular hairs. *Radical leaves* normally few, *bright green*, *elliptic-lanceolate*, acute, *denticulate or distantly and finely serrate-dentate*, cuneate or abruptly narrowed below to \pm long petioles : *stem-leaves* 4–6(–10, cult.), the lowest elliptic-lanceolate, acute, serrate-dentate, petiolate, the second similar but smaller and more shortly petioled, those above decreasing in size and becoming lanceolate to linear-lanceolate, acuminate, dentate to subentire (in cultivation several petiolate stem-leaves with many sharply serrate teeth may be produced) ; all *pilose* on both surfaces (or glabrescent above) with rather short hairs, with ciliate margins and \pm villous petioles. *Inflorescence* paniculate-corymbose, 1–6(–10)-headed, or many-headed with long lower branches when cultivated, the rather short peduncles floccose with many fine glandular and sometimes a few pilose hairs. *Heads of medium size*, rounded below. *Phyllaries* incumbent in bud, *olive- or dark green*, linear-lanceolate, subacute, \pm sparingly floccose, with many fine or more rarely dark glandular hairs and sometimes a few pilose hairs intermixed. Ligules glabrous-tipped. Styles fuscous or livid. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 3 mm. long.

This plant seems to differ essentially from *H. Lachenalii* in its slender habit, with more elliptic and evenly toothed foliage, and in its smaller panicle of less densely glandular heads. In cultivation, if the specimens sent out by Ley can be relied on, it becomes very much more luxuriant and develops several large cauline leaves, which are petioled and closely and sharply serrate, as well as a large, decompound panicle of heads.

Zahn (l. c. 363) refers *H. strumosum* doubtfully to *H. chlorophyllum* Jord. ex Bor. Fl. Centre, ed. 3, ii. 399 (1857), for which species he cites the exsiccata Linton no. 22, as *H. sciaphilum*. The only material of this set that has been examined does not agree with Zahn's account of *H. chlorophyllum*, and belongs to *H. Lachenalii* Gmel. No other British specimens of *H. chlorophyllum*, as distinct from *H. strumosum*, have been seen.

Distribution.—4. N. Devon : Tiverton (Still). 17. Surrey : Box Hill (Wallace). 34. W. Glo'ster : Stroud (Ley). Tutshill (Mrs. Wedgwood). 36. Hereford : Grwyne Valley (Ley). Great Doward (Roffey). 37. Worcester : Malvern (Towndrow). 42. Brecon : Llanwrtyd ! Mellte Glen (Ley). Nant Serre and Penwylt (Barton). 43. Radnor : Llandrindod and Aberedw (Barton). 48. Merioneth : Arthog (Barton). 49. Carnarvon : Cwm Idwal ! Capel Curig (Mennell). 56. Notts : Oxtou Hill (Carr).

Endemic ?

170. *HIERACIUM ACUMINATUM* Jordan, Cat. Grenoble, 17 (1849) ; *H. vulgatum* var. *acuminatum* Arv.-Touv. Alp. Fr. 86 (1888) ; Rouy, Fl. France, ix. 355 (1905) ; *H. vulgatum* subsp. *acuminatum* Sudre, Hier. Centr. Fr. 53 (1902) ; Zahn, l. c. 387 (1921).

Icon.—Sudre, l. c. pl. xv.

Exsicc.—A. Jordan, Lyon, 1852, in Hb. Kew; Bladon, Pontypool, 1847; Hort, Tintern, 1850; W. M. Rogers, Guiting, 1913; all in Hb. Mus. Brit.

Hypophyllopodous and robust. Stem 40–100 cm. high, \pm pilose throughout, becoming also floccose and with dark glandular hairs above. *Leaves bright green*, the basal (few and sometimes withering early) *ovate to elliptic-lanceolate*, obtuse to acute, *dentate*, shortly contracted to long petioles; *stem-leaves* 6–20, the lower elliptic to long-lanceolate, acuminate, petiolate, denticulate in the upper half, becoming sharply and deeply serrate-dentate towards the attenuate base, the middle and upper subsessile to sessile, gradually decreasing in size, long-acuminate, incisive-dentate with long, narrow teeth; all \pm pilose on both surfaces and on the margins, with long-pilose petioles. *Inflorescence* paniculate-corymbose, 10–many-headed, the peduncles densely floccose and glandular. *Heads of medium size*, rounded below. *Phyllaries* incumbent in bud, the outer rather lax, *olive-green with paler margins*, linear-lanceolate, obtuse, *floccose, with dense, strong, dark glandular hairs, epilose*. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits shortly dentate ap. Jordan. Achenes . . .

There is good material of this species at Kew, including an excellent specimen from Jordan himself, which sufficiently agrees with the original description. The plant is evidently closely related to *H. Lachenalii*, differing mainly in its taller and more leafy stem. It is recorded by Zahn (l. c.) for the south of England without definite localities and has now been traced from several counties.

There is an erroneous record for this plant for Asham, in North Somerset, in the B. E. C. Report, ix. pt. 3, p. 271 (1931). The specimen on which it is based is not *H. acuminatum*. It consists of two branches, one, in bud, a form of the *Tridentata* group, the other, in flower, a piece of *H. Lachenalii*!

Distribution.—17. Surrey: Witley (Hanbury). 33. E. Glo'ster: Guiting (Rogers). Slad Valley (Day). 35. Monmouth: Tintern (Hort). Pontypool (Bladon). 36. Hereford: Kerne Bridge (Roffey). 57. Derby: Rodsley (Linton).

General Distribution.—France. Germany. Austria.

B. *TRANSITORIA* Pugsley. (See page 30.)

Sect. VIII. ALPESTRIA.

Fries, *Epier.* 102 (1862); Williams, l. c. 82 (1902); Hanb. in Bab. Man. ed. 9, 263 (1904); W. R. Lint. Brit. Hier. 71 (1905); Rouy, Fl. Fr. ix. 263 (1905); Ostenfeld and Gröntved, Fl. Iceland and Faeroes, 164 (1934); *Prenanthis* spp. *H. carpathicum* & c. Zahn, l. c. 809 (1921).

Hypophyllopodous, aphyllopodous or rarely phyllopodous plants. Stem-leaves \pm numerous, green (not glaucous), \pm rounded at the base or the lower contracted to a winged petiole, always semi-amplexicaul. Inflorescence normally racemose-corymbose and few-headed except in *H. Dewarii* and *H. perthense*, often with one or two lower branches from the uppermost leaf-axils. Heads dark, with nearly effloccose phyllaries, which are incumbent in bud, usually obtuse, finely glandular and sparingly pilose (except *H. Dewarii* and *H. perthense*). Ligules glabrous-tipped in British species (excepting *H. Dewarii* and *H. perthense*). Styles yellow to livid. Margins of receptacle-pits \pm subulate-dentate (dentate-fimbriate in *H. praethulense*). Achenes dark or blackish brown.

Flowering in July and August.

The *Alpestria* have commonly been regarded as connected with the *Prenanthis* and indeed have been merged in that Section by Zahn, but there seems to be insufficient ground for this association, for although their stem-leaves are more or less

amplexicaul, they usually lack three leading features of the *Prenanthoidea*, viz :—the densely glandular inflorescence, the pilose-tipped ligules and the pale-coloured achenes. The more leafy-stemmed British forms rather show a transition towards the Section *Foliosa*, and some of them were originally described as members of that group.

The plants of this Section have a Central European as well as a Scandinavian (including Iceland and the Faeroes) distribution. All of the British species, except *H. dovrense*, *H. Dewarii* and *H. perthense*, are confined to the Shetland Islands, where they are comparatively rare plants, some known only from a single restricted station. As might be expected, their affinities lie chiefly with the boreal species. It is doubtful whether the last two of the above-mentioned exceptions are rightly placed in this Section. A further species, *H. Scullyi* W. R. Linton, from Kerry, in Ireland, was also included here by W. R. Linton, but this seems clearly more nearly allied to *H. gothicum* Fr. and is transferred accordingly.

Series *Dovrensia* [Grex *H. dovrense* Fr.].

Stem-leaves few (2–7), lanceolate to ovate-lanceolate. Ligules usually glabrous-tipped.

Stem-leaves 4–7, narrow, ± lanceolate, serrate, the lowest long-petioled.

Styles livid *H. dovrense*.

Stem-leaves 4–6, elliptic-lanceolate, remotely denticulate, more shortly petioled. Styles fuscous

H. pulchelliforme.

Plant phyllopodous; stem-leaves 2–3, ovate-lanceolate, serrate, sessile.

Styles yellow *H. zellundicum*.

Series *Protracta* [Grex *H. protractum* (Fr.) Zahn].

Stem-leaves 4–10, narrow, lanceolate-acuminate. Ligules glabrous-tipped.

Leaves all narrowed below, normally strongly purple-blotched. Styles yellow

H. pseudo-protractum.

Leaves (except the lowest) with rounded, amplexicaul base, not spotted.

Styles fuscous. Plant very slender *H. hethlandiae*.

Series *Subfoliosa* [Grex *H. truncatum* Lindbg.].

Stem-leaves generally broader, more numerous (4–18), these and the radical, at most, shortly petioled. Ligules glabrous-tipped.

* Stem and leaves pilose with bulbous-based hairs.

Leaves elliptic- to ovate-lanceolate, remotely denticulate. Heads broad, on medium peduncles. Styles livid

H. australius.

Leaves narrower, ± oblong-lanceolate, with fine, spreading teeth. Heads on long, slender peduncles. Styles dull yellow. (Var. *glussburnense* less hirsute.)

H. subtruncatum.

Leaves broad, oval-rhomboidal to ovate-lanceolate, with few short, spreading teeth. Heads on short peduncles. Styles dark livid. Plant dwarf....

H. breve.

** Stem less pilose; upper leaf-surface glabrescent.

Leaves elliptic-lanceolate to lanceolate, distantly denticulate. Heads on long, slender peduncles. Styles yellow. Margins of receptacle-pits dentate-fimbriate

H. praethulense.

Leaves lanceolate, finely denticulate. Heads broad, on slender peduncles. Styles livid

H. vinaceum.

Leaves oblong-lanceolate, more closely denticulate. Heads broad, on shorter peduncles. Styles livid. Plant dwarf

H. northroense.

Series *Spectabilia* [Grex *H. Dewarii* Syme].

Plants tall; stem-leaves large, numerous (6–15). Inflorescence paniculate-corymbose. Phyllaries densely pilose and glandular. Ligules pilose-tipped.

Leaves obovate- to ovate-lanceolate, subentire to denticulate. Heads of medium size, ± numerous; phyllaries slightly floccose. Styles dark livid.....

H. Dewarii.

Leaves elliptic-lanceolate to lanceolate, sharply denticulate. Heads large, ± numerous; phyllaries more floccose. Styles livid

H. perthense.

Series **Dovrencia**. (See page 220.)

171. *HIERACIUM DOVRENSE* Fries, Symb. 128 (1848); Epicr. 104 (1862); Williams, l. c. 161 (1902); W. R. Lint. Brit. Hier. 72 (1905); *H. carpathicum* subsp. *dovrense* Zahn, l. c. 810 (1921).

Exsicc.—Fries, Hier. Eur. no. 107; Lindbg. H. Sc. i. 39; Marshall no. 2021 (Ben Laoghal), in Hb. Hanbury; Dahlst. H. Sc. xxiii. 78, in Hb. Kew.

Hypophyllopodous or aphyllopodous. *Stem* 20–50 cm. high, \pm pilose throughout but chiefly so towards the base, becoming floccose and sometimes slightly glandular upwards. *Leaves* light or pale green, the primordial, when produced, small, oval, obtuse-mucronulate, obscurely denticulate, shortly attenuate below to long petioles, the remainder (4–7) cauline, the lowest linear-oblong, obtuse-mucronulate, denticulate, gradually narrowed below to long petioles, the median and upper becoming lanceolate and linear-lanceolate, acute, contracted to short, winged petioles or the upper sessile with rounded, semi-amplexicaul base, the median sharply and \pm finely serrate with entire apex; all pilose on both surfaces or glabrescent above. *Inflorescence* racemose-corymbose or paniculate-corymbose when luxuriant, 3–9(–12)-headed, with short accladium and straight, suberect branches, which, like the peduncles, are floccose with \pm numerous dark-based pilose and shorter, dark glandular hairs. *Heads* of medium size or rather small, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, the inner with paler margins, broad, lanceolate, obtuse, sparingly floccose (chiefly about the base and margins), with dark-based pilose and short, fine glandular hairs intermixed. Ligules usually glabrous-tipped. *Styles* livid. Margins of receptacle-pits subulate-dentate. Achenes dark brown, about 3.5 mm. long.

This species, which appears to be common in Norway, is recorded by W. R. Linton and by Zahn for Glen Roy, Inverness-shire, Ben Loyal (Laoghal), West Sutherland, and Shetland. The specimens seen from the first-named station (e.g. Linton no. 46 in Herb. Hanbury), however, apparently belong to *H. Dewarii* Syme, and the material from Unst, in Shetland, which was described by Beeby in 1908 as a variety *australius*, is clearly distinct from the typical Norwegian species and is here raised to separate specific rank. The plant from Ben Loyal seems correctly named. Williams's account is apparently based in part on the variety *australius*.

Distribution.—108. W. Sutherland: Ben Loyal (Marshall).

General Distribution.—Norway.

172. *HIERACIUM PULCHELLIFORME* (W. R. Linton) Pugsley in Journ. Ecol. xxxiii. 346 (1946).

H. pulchellum Williams, l. c. 162 (1902); Hanb. in Bab. Man. ed. 9, 263 (1904); non Lindbg. in Bot. Not. 120 (1872); *H. demissum* Strömfelt var. *pulchelliforme* W. R. Lint. Brit. Hier. 73 (1905); *H. demissum* subsp. *demissum* var. *pulchelliforme* Zahn, l. c. 855 (1921).

Exsicc.—W. R. Linton, Unst, 1886 (type), in Hb. Mus. Brit. as *H. pulchellum* var. *vestitum*; Hanbury, Unst, 1894, in Hb. Hanbury, as *H. pulchellum* var.

Hypophyllopodous. *Stem* 15–35 cm. high, slender, reddish below, pilose (chiefly about the base) and slightly floccose upwards. *Leaves* yellowish green; the radical few, obovate, obtuse-mucronulate to elliptic-lanceolate, acute, remotely denticulate with sharp, spreading denticulations, attenuate below to \pm short petioles; cauline 4–6, elliptic-lanceolate to lanceolate, acuminate, similarly denticulate, the lower contracted to short, winged petioles, the upper sessile with rounded, semi-amplexicaul base; all pilose with stiff hairs on margins and both surfaces. *Inflorescence* racemose-corymbose, 2–6-headed, with sometimes one or two lower branches from the upper leaf-axils; peduncles slender, suberect, floccose. *Heads* of medium size or rather

large, truncate-based. Phyllaries incumbent in bud, blackish green (the inner paler), linear-lanceolate, obtuse, sparingly floccose (chiefly towards the base), with ± numerous pilose hairs of moderate length and occasional fine glandular hairs intermixed. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3 mm. long.

This plant, discovered in 1886 by Beeby and W. R. Linton on the west side of Burra-firth, Unst, Shetland, and again collected there by Hanbury in 1894, was referred by Lindeberg to his *H. pulchellum* as a new variety *vestitum*, differing from the Norwegian type in its more richly clothed foliage and flower-heads. It can be seen, however, on comparison with Lindeberg's authentic material (H. Sc. Exs. ii. 70) that the Shetland form is a more robust plant with not only hirsute but broader leaves with a different form of denticulation; and further, its heads are much larger and broader, with fairly pilose instead of subglabrous phyllaries. It is therefore treated as a species distinct from *H. pulchellum* Lindbg. The other similar plant, to which it has been tentatively referred, is the Icelandic *H. demissum* Strömf. No specimens of this have been seen, but it appears from the description to differ sufficiently by its narrower foliage and smaller, narrower heads.

Distribution.—112. Shetland : Unst (Beeby).

Endemic.

173. *HIERACIUM ZETLANDICUM* Beeby in Journ. Bot. xxix. 243 (1891); Williams, l. c. 126 (1902); Hanb. in Bab. Man. ed. 9, 263 (1904); W. R. Lint. Brit. Hier. 37 (1905); *H. demissum* subsp. *zetlandicum* Zahn, l. c. 855 (1921).

Exsicc.—Beeby nos. 1044, 1082, 1084 and 1660, in Hb. Hanbury; Beeby nos. 1083 and 1649, in Hb. Mus. Brit.

Phyllopodous. *Stem* 10–30 cm. high, slender, *pilose* (especially below), becoming ± floccose and with black-based hairs above. *Leaves* dull green; the *radical* (3–5) *elliptic* to *elliptic-lanceolate*, obtuse-mucronulate to acute, *denticulate* to *serrate* with forward-pointing teeth, *narrowed below to short, winged petioles*; the *cauline* 2–3, *ovate-lanceolate* to *lanceolate*, acuminate, *serrate*, *sessile* with ± amplexicaul base; all usually *pilose with stiff hairs* on margins and both surfaces. *Inflorescence* racemose-corymbose, 2–7 (–15, cult.)-headed, with suberect branches and sometimes geminate terminal heads; peduncles floccose with numerous dark glandular and occasionally some dark pilose hairs. *Heads* rather small, narrow, rounded below. *Phyllaries* incumbent in bud, *blackish green, linear-lanceolate, subacute, efloccose, with numerous fine, dark and some longer glandular hairs*, epilose. *Ligules* glabrous-tipped. *Styles* yellow. *Margins of receptacle-pits* subulate-dentate. *Achenes* blackish brown, 3.5–4 mm. long.

H. zetlandicum was originally discovered by Beeby in 1889 on low hills at Sand Voe, Northmaven, Shetland, and two years later it was found at North Roe, in the same island. It differs considerably from the other British species of the Section *Alpestrina* in being of a truly phyllopodous habit of growth, but its inflorescence and head-clothing sufficiently indicate that its main affinity lies with this group. It is probably allied to *H. Hartzianum* Dahlst., of the Faeroes, which seems separable by its less hirsute foliage and floccose-edged phyllaries.

Distribution.—112. Shetland : Northmaven (Beeby).

Endemic,

Series **Protracta**. (See page 220.)174. **HIERACIUM PSEUDO-PROTRACTUM** sp. nov.

H. protractum Hanb. in Journ. Bot. xxx. 131 (1892); in Bab. Man. ed. 9, 264, as a form (1904); Williams, l. c. 163 (1902); W. R. Lint. Brit. Hier. 74 (1905); *H. protractum* subsp. *protractum* Zahn, l. c. 827 (1921), ex parte; *H. protractum* var. *shetlandicum* Dahlst. in Johnston, Add. Fl. Shetland, iii. 2, (1929); non *H. dovrense* var. *protractum* Fr. Epicr. 104 (1862), nec *H. protractum* Lindbg. H. Sc. Exs. i. 40 (1868); Hartm. Skand. Fl. ed. 10, 30 (1870).

Icon.—Pl. 10, fig. a.

Exsicc.—Hanbury, Loch-a-Cliff, Unst, 1894 (type), in Hb. Hanbury; Beeby nos. 610, 611 and 1093, all in Hb. Mus. Brit. and Hb. Hanbury, as *H. protractum*.

Planta hypophyllopoda. *Caulis* 20–50 cm., vulgo gracilis, inferne purpurascens, basin versus pilis patulis hirsutus, supra glabrescens. *Folia* luteo-viridia, nisi in umbrosis valde purpureo-centonata; radicalia ovalia obtuso-mucronulata ad oblongo-lanceolata, acuta, obscure denticulata, in petiolum longum vel brevem contracta; caulina 4–10, lanceolata, conspicue acuminata, remote denticulata, inferiora in petiolum brevem alatum angustata, superiora sessilia, semi-amplexicaulia; omnia utrinque et in marginibus \pm pilosa. *Anthela* racemoso- ad paniculato-corymbosa, 2–17(–30 in cultis)-cephala, acladio brevi (nonnunquam capitulis pseudo-geminatis) et, in plantis validis, ramis longis inferioribus; pedunculi floccosi, saepius pilis multis obscuris patulis glandulisque nonnullis tenuibus immixtis obsiti. *Involutura satis parva angustaque*, basi subtruncata. *Squamae atrovirides*, latiusculae, lineari-lanceolatae, obtusae, viz floccosae, senescentes, pilis multis longis basi obscuris glandulisque brevibus tenuibus vestitae. *Ligulae* apice glabrae. *Styli lutei*. Alveoli receptaculi margine argute dentati.

Hypophyllopodous. *Stem* 20–50 cm. high, generally slender, purplish below, pilose with spreading hairs towards the base, glabrescent above. *Leaves* yellowish green, profusely blotched with reddish purple, unless in shade; the radical oval, obtuse-mucronulate to oblong-lanceolate, acute, obscurely denticulate, contracted below to long or short petioles; cauline 4–10, lanceolate, sharply acuminate, remotely denticulate, the lower contracted to short, winged petioles, the upper sessile, semi-amplexicaul; all \pm pilose on margins and both surfaces. *Inflorescence* racemose to paniculate-corymbose, 2–17(–30, cult.)-headed, with short acladium, sometimes with falsely geminate terminal heads, and long lower branches when luxuriant; peduncles floccose, generally with many dark, spreading pilose and some fine glandular hairs. *Heads* rather small and narrow, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, rather broad, linear-lanceolate, obtuse, scarcely floccose, senescent, with many long, dark-based pilose and short, fine glandular hairs. *Ligules* glabrous-tipped. *Styles* yellow. Margins of receptacle-pits sharply dentate. Achenes blackish brown, about 3.5 mm. long.

This plant is allied to *H. dovrense* var. *protractum* Fr., as exemplified in the exsiccatae Fries, Eur. Hier. 130 bis, and Lindeberg, H. Sc. Exs. i. 40 and 41, but differs in its less amplexicaul and more richly marked foliage, its pilose peduncles, and its darker, more pilose but less floccose phyllaries. It seems to have been first collected by Tate in 1865 at Burrafirth, Unst, and subsequently by Beeby at Loch-a-Cliff in the same island, Cliva Hill, Mainland, Mid Yell Voc and Lumbister. It was again found at Loch-a-Cliff in 1894 by Hanbury, who obtained some remarkably fine specimens.

At first sight the form of the leaves in *H. pseudo-protractum* and their unusual colouring recall *H. stictophyllum* Dahlst., of the Section *Tridentata*, but this may readily be distinguished by its more leafy stem, more paniculate inflorescence with longer branches and peduncles, and larger, broader heads.

Distribution.—112. Shetland: Unst, Yell, Mainland, &c. (Beeby). Fetlar (Johnston).

Endemic,

175. *HIERACIUM HETHLANDIAE* (F. J. Hanbury) Pugsley in Journ. Ecol. xxxiii. 346 (1946).

H. dovrense var. *hethlandiae* Hanb. in Journ. Bot. xxxii. 232 (1894); in Bab. Man. ed. 9, 264 (1894); W. R. Lint. Brit. Hier. 72 (1905); *H. aestivum* subsp. *crocatum* subvar. *hethlandiae* Zahn, l. c. 922 (1922).

Exsicc.—Beeby no. 1107 (type), in Hb. Mus. Brit. and Hb. Hanbury; no. 1151, in Hb. Mus. Brit.

Hypophyllopodous or aphyllopodous. *Stem* 20–40 cm. high, very slender, reddish, pilose below, becoming floccose upwards. *Leaves* dull green; the radical, if produced, oblong-lanceolate, acute, subentire, contracted below to short, winged petioles; the *cauline* 5–9, narrow-lanceolate, finely acuminate, distantly denticulate, all but the lowest sessile with relatively broad, rounded, amplexicaul base, the lowest ± abruptly contracted below, scarcely petiolate; all pilose on margins and both surfaces, or the upper glabrescent above. *Inflorescence* racemose-corymbose, 2–4-headed, with slender, generally sparingly floccose peduncles. *Heads* of medium size, rounded below. *Phyllaries* incumbent in bud, blackish green, linear-oblong, obtuse, sparingly floccose, with many fine, dark glandular and some longer pilose hairs. *Ligules* glabrous-tipped. *Styles* fuscous. *Margins* of receptacle-pits . . . *Achenes* blackish brown, nearly 4 mm. long.

This rare plant was first collected by Beeby in 1891 on rocks by Cliva Hill, near Brae, Delting, Mainland, Shetland. It is very distinct in its slender habit, with narrow, attenuate, sharply pointed foliage. Elfstrand likened it to *H. dovrense* subsp. *humidorum* Almq., but this, as represented in the exsiccata Dahlst. H. Exs. iii. 77 (1889), is a taller plant with much broader and less pointed leaves, the lower contracted into long petioles. Its flower-heads are also smaller. It is not easy to understand Zahn's transfer of this plant to *H. crocatum*, for he seems to have seen the exsiccata Beeby no. 1151.

Distribution.—112. Shetland: Mainland (Beeby).

Endemic.

Series **Subfoliosa**. (See page 220.)

176. *HIERACIUM AUSTRALIUS* (Beeby) Pugsley in Journ. Ecol. xxxiii. 346 (1946).

H. dovrense Hanb. in Bab. Man. ed. 9, 264, as a form (1904); *H. dovrense* subsp. *demissum* var. *australius* Beeby in Ann. Scot. Nat. Hist. 114 (1908).

Exsicc.—Hanbury, Unst, 1894; Beeby nos. 609 and 859; all in Hb. Mus. Brit. and Hb. Hanbury; Linton no. 156 (cult.), in Hb. Mus. Brit.

Hypophyllopodous. *Stem* 20–45 cm. high, rather robust, pilose, especially below, with spreading hairs. *Leaves* yellowish green; the radical (often few) oval to elliptic-lanceolate, rounded-obtuse-mucronulate to acute, subentire or remotely denticulate, narrowed below to short, winged petioles; *cauline* 6–12, elliptic-lanceolate to ovate-lanceolate, acute, remotely denticulate, the lower shortly attenuate below, semi-amplexicaul, the upper sessile with rounded, semi-amplexicaul base; all pilose on margins and both surfaces with stiff, bulbous-based hairs. *Inflorescence* racemose- to paniculate-corymbose, 2–10-headed, with ± short accladium and erect-spreading branches; peduncles sparingly floccose with a few scattered pilose hairs. *Heads* of medium size or rather large, broad, truncate-based. *Phyllaries* incumbent in bud, blackish green (the inner paler), linear-lanceolate, obtuse, very sparingly floccose, with fine glandular and a few pilose hairs. *Ligules* glabrous-tipped. *Styles* livid. *Margins* of receptacle-pits sharply subulate-dentate. *Achenes* deep brown, 3–3.5 mm. long.

This plant, first collected in 1886 by Beeby on rocks at Loch-a-Cliff, in Unst, Shetland, and subsequently (1894) by Hanbury, differs from *H. dovrense* in its more foliaceous stem, with leaves shorter, less toothed and less attenuate below, and in

its distinctly larger and broader heads. It is recorded as *H. dovrense* by Zahn (l. c. p. 810) but he does not appear to have seen any specimens.

The Icelandic species, *H. demissum* Strömf., with which it was associated by Beeby, is a widely different plant, with only two to five oblong-lanceolate stem-leaves and narrower heads. *H. truncatum* Lindbg. is distinguishable by its slender and more glabrous growth, with much narrower, petiolate foliage.

Distribution.—112. Shetland: Unst (Beeby).

Endemic.

177. *HIERACIUM SUBTRUNCATUM* Beeby in Ann. Scot. Nat. Hist. 114 (1908). *H. truncatum* Hanb. in Bab. Man. ed. 9, 264, as a form (1904); W. R. Lint. Brit. Hier. 75 (1905); non Lindbg. Hier. Sc. Exs. i. 45 (1868).

Exsicc.—Beeby nos. 1105, 1153 and 1154, in Hb. Mus. Brit.

Aphyllopodous or rarely hypophyllopodous. Stem 15–50 cm. high, slender, flexuous, reddish, pilose throughout (densely so below) with long, spreading, whitish hairs, which are dark-based towards the inflorescence. Leaves 10–15, olive green, all sessile, gradually smaller upwards, acute, with a few distant, fine, spreading teeth, the lowest oblong-lanceolate, abruptly contracted below, the median with rounded, semi-amplexicaul base, the uppermost narrowly ovate-lanceolate, with subcordate, semi-amplexicaul base; all pilose on margins and both surfaces with rough, bulbous-based hairs, ± floccose beneath. Inflorescence racemose-corymbose, 1–7(–13)-headed, with long, slender, suberect branches and peduncles, which are sparingly floccose with ± numerous dark-based pilose and occasionally a few fine, dark glandular hairs. Heads of medium size or rather large, rounded below. Phyllaries incumbent in bud, blackish green, broad, linear-oblong, obtuse, almost effloccose, with a few fine, dark glandular and occasionally some solitary dark pilose hairs. Ligules glabrous-tipped. Styles dull yellow. Margins of receptacle-pits apparently subulate-dentate. Achenes blackish, about 4 mm. long.

β. glussburnense var. nov.

Exsicc.—Beeby nos. 1040 (type) and 1104, both in Hb. Mus. Brit. and Hb. Hanbury, as *H. Friesii*.

Caulis quam in typo magis viridis, plane minus pilosus; folia superne ± glabrescentia; squamæ interiores pallidiores.

Stem much greener and less pilose than in the type; leaves ± glabrescent on the upper surface; inner phyllaries paler.

This plant differs considerably from *H. truncatum* Lindbg., which is nearly glabrous both in stem and foliage, with petiolate basal leaves. The material sent out by Lindeberg as Hier. Sc. Exs. i. 45, does not seem homogeneous, for while some specimens show numerous long-acuminate cauline and shortly petioled basal leaves, others have fewer, blunter and more toothed leaves, the lower with long petioles. The inflorescence of all the specimens, however, differs from that of *H. subtruncatum* by a shorter acaulium and more spreading branches. W. R. Linton's description seems to be based, at least in part, on Lindeberg's exsiccata rather than on Beeby's Shetland plants.

H. subtruncatum was discovered by Beeby in 1891 at Hamar Voc and the neighbouring ravine of Eala Water, in Northmaven, the variety two years earlier on banks above the Gluss Burn, near Ollaberry, Mainland.

In 'British Hieracia' W. R. Linton records *H. truncatum* also from Melte Glen, Brecon. This record appears to be based on a plant sent to Ley in 1893 and subsequently cultivated (vide Journ. Bot. xlvii. 51 (1909)). I have seen no specimens but it seems unlikely that the name is correct.

Distribution.—112. Shetland : Northmaven (Beeby).

var. *glussburnense*.

112. Shetland : Ollaberry, Mainland (Beeby).

Endemic.

178. *HIERACIUM BREVE* Beeby in Ann. Scot. Nat. Hist. 112 (1908).

Exsicc.—Beeby nos. 1043 and 1092, in Hb. Mus. Brit.

Hypophyllopodous. *Stem* 10–30 cm. high, densely pilose with spreading hairs, especially towards the base. *Leaves* dull green, broad; the radical oval-rhomboidal, obtuse to acute, remotely denticulate, abruptly contracted below to short, winged, villous petioles; the cauline 4–9, elliptic to ovate-lanceolate, acuminate, with 2–3 short, spreading teeth on each side, sessile, the lower shortly attenuate below, the upper with rounded, semi-amplexicaul base; all pilose with stiff hairs on margins and both surfaces. *Inflorescence* compactly racemose-corymbose, 2–6(–13, cult.)-headed, with short accladium and suberect branches, peduncles floccose, with some dark-based pilose and a few glandular hairs. *Heads* of medium size, truncate-based. *Phyllaries* incumbent in bud, blackish green, broad, linear-lanceolate, obtuse, scarcely floccose, with some fine glandular hairs, nearly epilose. *Ligules* glabrous-tipped. *Styles* dark livid. *Margins* of receptacle-pits subulate-dentate. *Achenes* blackish brown, 3–3.5 mm. long.

This apparently very rare plant was collected in 1889 and 1891 by Beeby in a single locality, rocks near Roeness Voe, Northmaven, Shetland. In his description Beeby likens it to *H. Scullyi* W. R. Linton, which it recalls by its broad cauline leaves. But it is essentially a smaller plant with the inflorescence and heads of the *Alpestris*, and under cultivation it tends to revert to an almost phyllopodous habit, when it somewhat resembles *H. zelandicum*.

Distribution.—112. Shetland : Northmaven (Beeby).

Endemic.

179. *HIERACIUM PRAETHULENSE* sp. nov.

H. auratum var. *thulense* Hanb. in Journ. Bot. xxxii. 232 (1894); in Bab. Man. ed. 9, 267 (1904); W. R. Lint. Brit. Hier. 89 (1905); non *H. thulense* Dahlst.; *H. aestivum* subsp. *crocatum* Zahn, l. c. 922 (1922), ex parte.

Exsicc.—Beeby nos. 1041, 1042, 1108, 1109, 1111, 1112, 1114, 1115 (type), and 1116, in Hb. Hanbury.

Planta hypophyllopoda vel aphyllopoda. *Caulis* 25–60 cm., flexuosus, ± gracilis, rubescens, inferne pilosus, sursum floccosus glabrescens. *Folia radicalia* pauca vel 0, oblongo-obovata, rotundato-obtuso-mucronulata, remote denticulata, in petiolum brevem alatum angustata; *caulina* 7–12, elliptico-lanceolata ad lanceolata, acuta ad acuminata, remote denticulata, sessilia, semi-amplexicaulia, inferiora inferne attenuata, superiora basi rotundatâ vel cordatâ; omnia utrinque et in marginibus pilosa vel saepe ± glabrescentia, superiora inferne floccosa. *Anthela* racemoso-corymbosa, 2–9-cephala, ramis tenuibus ± longis suberectis; pedunculi floccosi. *Involucra* mediocria ad majuscula, basi rotundata. *Squamae* atrovirides, interiores in margine pallidiores, latiusculae, lineari-oblongae, obtusae, parce floccosae, glandulis sparsis tenuibus longioribusque et pilis solitariis immixtis. *Ligulae* apice glabrae. *Styli* lutei. *Alveoli receptaculi* margine dentato-fimbriati.

Hypophyllopodous or aphyllopodous. *Stem* 25–60 cm. high, flexuous, ± slender, reddish, pilose below, becoming glabrescent and floccose upwards. *Leaves* bright green, the radical few or 0, oblong-obovate, rounded-obtuse-mucronulate, remotely

denticulate, *narrowed below to short, winged petioles*; the *cauline* 7–12, *elliptic-lanceolate to lanceolate*, acute to acuminate, *remotely denticulate, sessile and semi-amplexicaul*, the lower attenuate below, the upper with rounded or cordate base; all *pilose* on both surfaces and on margins, or *frequently ±glabrescent*, the upper floccose beneath. *Inflorescence* racemose-corymbose, 2–9-headed, with slender, *±long, suberect branches*; the peduncles floccose. *Heads* of medium size or rather large, rounded below. *Phyllaries* incumbent in bud, *blackish green*, the inner with paler margins, *rather broad, linear-oblong*, obtuse, *sparingly floccose*, with scattered fine and longer glandular hairs and occasional pilose hairs intermixed. Ligules glabrous-tipped. *Styles* yellow. *Margins of receptacle-pits* dentate-fimbriate. Achenes dark reddish-brown, 3.5–4 mm. long.

This plant, found by Beeby on rocks at Roeness Voe, Northmaven, Shetland, in 1889 and 1891, is characterized by a slender, flexuous habit, rather narrow, semi-amplexicaul foliage, dark, slightly clad involucre and yellow styles. Its hypophyllopodous habit, together with its semi-amplexicaul leaves and dark, sparsely clad phyllaries, indicate an affinity with the *Alpestris* rather than with *H. auratum* Fr. or *H. crocatum* Fr., as was suggested by Dahlstedt and Zahn.

H. thulense Dahlst. is a Prenanthoidean species (a native of Iceland) with a taller and more leafy stem and a compound inflorescence of densely glandular peduncles and phyllaries.

A specimen in Herb. Druce, named *H. polycomum* Dahlst. (*H. polycomatum* Zahn), is perhaps *H. praethulense*, but is now too damaged for certain determination.

Distribution.—112. Shetland: Northmaven (Beeby).

Endemic.

180. *HIERACIUM VINACEUM* (Beeby) Pugsley in Journ. Ecol. xxxiii. 346 (1946).

H. crocatum var. *vinaceum* and *H. strictum* var. *humilius* Beeby in Ann. Scot. Nat. Hist. 115 (1908).

Exsic.—Beeby no. 1087 (type), as *H. crocatum* in Hb. Mus. Brit.; Beeby nos. 1088–1091, 1156 and 1633.

Aphyllopodous. *Stem* 25–45 cm. high, slender, purplish below or occasionally throughout, pilose with spreading hairs, chiefly towards the base, becoming glabrescent above. *Leaves* 10–18, yellowish or olive-green; the lower oblong to lanceolate, obtuse-mucronulate to acute, obscurely denticulate, attenuate below to long or short, winged petioles; median lanceolate, acute to acuminate, finely denticulate, narrowed below to a sessile, semi-amplexicaul base; upper similar, but smaller and rather more broadly based; all pilose beneath, less so or glabrescent above, margins softly ciliate, those of the upper leaves sometimes becoming scaberulous. *Inflorescence* racemose-corymbose, 2–4(–9)-headed, with slender, suberect branches exceeding the ±short accladium; peduncles floccose, with some scattered, spreading pilose hairs. *Heads* rather large and broad, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, broad, linear-lanceolate, obtuse, slightly floccose below, with some fine, dark glandular and a few longer pilose hairs intermixed. Ligules glabrous-tipped. *Styles* livid. *Margins of receptacle-pits* shortly dentate. Achenes blackish brown, about 4 mm. long.

This plant was first collected by Beeby in 1891 at Roeness Voe, Northmaven, and referred to *H. crocatum* Fr. In 1896 a similar plant was found in another station (Hillswick) in Northmaven, and again in 1902 on the island of Sandsting. These latter plants were sent for the opinion of Dahlstedt, who apparently suggested 'strictum, var. or form'. In a paper 'On the Flora of Shetland', published in

Ann. Scot. Nat. Hist. (l. c.), Beeby described the Hillswick and Sandsting plants as *H. strictum* var. *humilius* and the Roeness Voe form as *H. crocatum* var. *vinaceum*, the latter name in allusion to its purplish or wine-coloured stem. A comparison of the specimens from the three stations now in Herb. S. London Bot. Inst., Herb. Mus. Brit. and Herb. Hanbury shows that they are all conspecific, and they are now treated accordingly. Their affinities seem to lie with the group *Alpestris* rather than with the *Foliosa*.

A sheet of 'Beeby 1088' in Herb. Hanbury was identified by Elfstrand with *H. crocatum* subsp. *angustum* var. *platylepium* Dahlst., and *H. platylepium* Dahlst. was consequently inserted in Druce's Plant List.

Distribution.—112. Shetland : Northmaven and Sandsting (Beeby).

Endemic.

181. HIERACIUM NORTHROENSE sp. nov.

H. crocatum var. *congestum* Beeby in Ann. Scot. Nat. Hist. 115 (1908), ex parte ; non *H. congestum* Freyn in Oest. Bot. Zeit. xli. 56 (1891).

Exsicc.—Beeby no. 1085 (type) in Hb. S. Lond. Bot. Inst. ; no. 1086 in Hb. Mus. Brit. and Hb. Hanbury.

Planta hypophyllopoda vel aphyllopoda. *Caulis* 20–30 cm., *gracilis, flexuosus*, rubescens, ad basin pilis patentibus hirsutus, tandem superne glabrescens. *Folia* 10–15, luteo-viridia nonnunquam marginibus rubicundis, sensim sursum minora, omnia *sessilia*, semi-amplexicaulia *vel basalia in petiolum brevem alatum contracta* ; *infima oblanceolata* ad lanceolata, acuta, *denticulis parrulis numerosis munita*, *superiora lanceolata*, basi latiuscule rotundatâ, similiter denticulata ; omnia *inferne et in marginibus pilosa, superne subglabra* (infimis exceptis). *Anthela* racemoso-corymbosa, 2–4(–12, cult.)-*cephala*, *ramis brevibus gracilibus acladium haud superantibus* ; pedunculi parce floccosi, pilis paucis basi obscuris glandulisque solitariis obscuris obsiti. *Involucra mediocria, lata*, basi subtruncata. *Squamae* (exteriores laxiusculae) *atrovirides, lineari-lanceolatae*, obtusae, *inferne sparsim floccosae, glandulis tenuibus obscuris vestitae, epilosae*. *Ligulae apice glabrae. Styli lividi*. *Alveoli receptaculi margine subulato-dentati*.

Hypophyllopodous or aphyllopodous. *Stem* 20–30 cm. *high, slender, flexuous*, reddish, pilose with spreading hairs about the base, becoming glabrescent above. *Leaves* 10–15, yellowish green, sometimes with reddish margins, gradually decreasing upwards, all *sessile* and semi-amplexicaul or the basal narrowed into short, winged petioles ; the lowest oblanceolate to lanceolate, acute, with numerous fine denticulations, the upper lanceolate with rather broad, rounded base, similarly denticulate ; all pilose beneath and on the margins, subglabrous above (except the lowest). *Inflorescence* racemose-corymbose, 2–4(–12, cult.)-headed, with short, slender branches not exceeding the acladium ; the peduncles sparingly floccose, with a few dark-based pilose and solitary dark glandular hairs. *Heads of medium size, broad*, with subtruncate base. *Phyllaries* incumbent in bud, the outer rather lax, blackish green, linear-lanceolate, obtuse, sparingly floccose below, with fine, dark glandular hairs, epilose. *Ligules* glabrous-tipped. *Styles livid*. *Margins of receptacle-pits subulate-dentate*. *Achenes dark brown, about 3.5 mm. long*.

This plant, discovered by Beeby in 1891 among short grass near North Roe, Northmaven, is distinct in the regular denticulation of its foliage, which becomes more pronounced under cultivation. Its closest affinity appears to be with *H. vinaceum* and *H. praethulense*, from the former of which it differs by its rather broader and more markedly denticulate leaves, the relatively short branches of its inflorescence, and its epilose phyllaries. *H. praethulense* is separable by its taller growth, larger,

remotely denticulate foliage, long-branched inflorescence, less broad heads and yellow styles. The form from Sandsting, referred to by Beeby, is separated as a new species *H. obesifolium*.

Distribution.—112. Shetland : Northmaven (Beeby).

Endemic.

Series **Spectabilia**. (See page 220.)

182. *HIERACIUM DEWARII* Syme in B. E. C. Report, 23 (1876) ; Trans. Bot. Soc. Edin. xiii. 211 (1878) ; Williams, l. c. 162 (1902) ; Hanb. in Bab. Man. ed. 9, 265 (1904) ; W. R. Lint. Brit. Hier. 73 (1905) ; *H. carpathicum* subsp. *Dewarii* Zahn, l. c. 812 (1921).

Icon.—Trans. Bot. Soc. Edin. xiii. pl. 5.

Ersicc.—Boswell-Syme, Glen Devon, 1876 ; Linnmill and Dollar, Clackmannan, 1876 ; all in Hb. Mus. Brit. and Hb. Hanbury ; Hanbury, Killin, 1888, and Lawers Burn, 1888 ; both in Hb. Hanbury ; Linton no. 47.

Aphyllopodous or hypophyllopodous. *Stem tall*, 30–100 cm. high, often flexuous, \pm pilose, the upper part with dark-based hairs. *Leaves* \pm large, light green ; the *radical*, if produced, *obovate-lanceolate*, rounded-obtuse-submucronulate, remotely subdenticulate, *attenuate below to short petioles* ; *cauline* 6–15, the *lower linear-oblong to oblanceolate*, acuminate, *subentire* or obscurely denticulate, *narrowed below to short or long winged petioles*, the *upper* becoming shorter and smaller, \pm *ovate-lanceolate*, denticulate, and *sessile* with rounded, semi-amplexicaul base ; all *shortly pilose on margins and both surfaces*, but *sometimes glabrescent above*. *Inflorescence paniculate-corymbose*, 3–15(–20)-headed (more when cultivated), with *suberect, leafy branches* often exceeding the short accladium, the lower springing from the upper leaf-axils ; peduncles floccose, with dark-based pilose and sometimes fine glandular hairs. *Heads of medium size*, rounded below. *Phyllaries* incumbent in bud, *dark olive-green* (the inner with paler margins), few, *linear-oblong*, obtuse, *slightly floccose* towards the base, with *dense, long and short, dark glandular and numerous long, dark pilose hairs* intermixed. *Ligules slightly pilose-tipped*. *Styles dark livid*. Margins of receptacle-pits sharply and irregularly subulate-dentate. Achenes deep brown, 3.5–4 mm. long.

This is a very distinct species, generally of clearly aphyllopodous growth. Occasionally it develops a basal rosette of leaves, and then the cauline leaves are less numerous. This latter form is represented in Linton's exsiccata no. 47 (origin, Mid Perth, cult. Bournemouth), and there is a similar plant in Herb. Hanbury collected by Buchanan-White at Lochearnhead in 1891. The sheet of Linton no. 46 (as *H. dovreense*) in Herb. Hanbury is typical *H. Dewarii* ; the specimen was gathered in Glen Roy, W. Inverness, by Marshall and Shoolbred.

H. Dewarii and the following species differ considerably from the other British members of the *Alpestris*, by their stronger growth, more hirsute and glandular phyllaries, and ciliate ligules ; and they should possibly be placed in a separate Section. They do not occur in the Shetlands.

Distribution.—85. Fife : Tethan's Den (Drummond). 87. W. Perth : Menstrie (Glen Groves). Glen Devon and Dollar (Boswell-Syme). Linnmill (Drummond). 88. Mid Perth : Glen Falloch ! Am Binnein (Hanbury). Comrie (Melvill). Killin ! Lawers Burn (Marshall). Lochearnhead (Buchanan-White). 96. E. Inverness : Kingussie (Marshall). 97. W. Inverness : Glen Roy (Marshall and Shoolbred). 98. Argyll : Clach Leathad (Hanbury).

Endemic.

183. *HIERACIUM PERTHENSE* Williams, Prodr. iii. 163 (1902); W. R. Lint. Brit. Hier. 75 (1905); *H. dovrense* var. *spectabile* Marshall in Journ. Bot. xxxii. 216 and 232 (1894); Hanb. in Bab. Man. ed. 9, 264 (1904); *H. carpathicum* subsp. *perthense* Zahn, l. c. 813 (1921).

Exsicc.—Marshall no. 896; Linton no. 72; both as *H. dovrense* var. *spectabile*.

Aphyllopodous or hypophyllopodous. *Stem* 30–90 cm. high, robust, pilose with spreading hairs below, becoming \pm floccose upwards. *Leaves* large, dull green, with rather conspicuous venation; *radical*, when present, *oval to elliptic-lanceolate, sub-entire*, mucronulate, narrowed below to short, winged petioles; *cauline* 6–13, the lower and median *lanceolate to elliptic-lanceolate*, acute, *sharply denticulate with spreading teeth*, sessile or the lowest narrowed into short, winged petioles, the upper ovate-lanceolate, acuminate, denticulate or dentate, with rounded, semi-amplexicaul base; all \pm pilose on margins and both surfaces, or sometimes glabrescent above. *Inflorescence* *paniculate-corymbose*, 3–12(–20, cult.)-headed, with slender, leafy or bracteolate, floccose and slightly pilose branches and peduncles. *Heads* large, rounded below. *Phyllaries* incumbent in bud, *dark olive-green, broad, linear-oblong*, obtuse, *floccose, especially on the margins, senescent, with numerous glandular and long, dark-based pilose hairs*. *Ligules* pilose-tipped. *Styles* livid. Margins of receptacle-pits sharply subulate-dentate. Achenes deep brown, about 4.5 mm. long.

This is a handsome species with fine foliage and large, showy heads. It is most nearly related to *H. Dewarii*, from which it differs by its more toothed foliage and much larger heads with more floccose phyllaries. It was discovered by E. S. Marshall in 1892 near the Lochsie Burn, in Glen Shee, East Perth.

A plant collected by Riddelsdell in 1902 at Thurso (now in Herb. Mus. Brit.) has been referred to this species and perhaps correctly so. It is a smaller plant than the Glen Shee form, with fewer stem-leaves, the lower contracted to long, slender petioles. Further specimens are needed for its satisfactory determination.

Distribution.—89. E. Perth: Glen Shee (Marshall). 90. Forfar: Clova (W. R. Linton).

Endemic.

SECT. IX. **PRENANTHOIDEA.**

Koch, Syn. Fl. Germ. ed. 2, ii. 528 (1844); Fries, Epier. 118 (1862); Williams, l. c. 83 (1902); Hanb. in Bab. Man. ed. 9, 265 (1904); W. R. Lint. Brit. Hier. 84 (1905), ex parte; Zahn, l. c. 747 (1921), ex parte.

Tall aphyllopodous or rarely hypophyllopodous plants. Leaves heteromorphous, the lowest petiolate, the remainder sessile and semi-amplexicaul (the median often contracted above the semi-amplexicaul base and so \pm panduriform in shape), reticulate-veined beneath. Inflorescence paniculate-corymbose, often many-headed, with conspicuously glandular branches and peduncles. Heads small, with obtuse, densely glandular, usually epilose phyllaries, which are incumbent in bud. Ligules pilose-tipped. Styles livid. Margins of receptacle-pits elevated, incise-dentate. Achenes fulvous or pale yellowish brown in British species.

The plants of this distinct Section are generally inhabitants of mountain woods and occur throughout Europe and Western Asia. In Britain the solitary well-known species, *H. prenanthoides*, which in this country is not confined to woodland districts, is spread over Scotland and the north of England, with outliers in Mid Wales. It is recorded also for Northern Ireland, but no correctly named Irish specimens have been seen.

Flowering from July to September.

- Aphyllopodous with very leafy stem. Lower leaves gradually contracted to short, winged petioles; median lanceolate, \pm distinctly panduriform. Phyllaries rather broad *H. prenanthoides*.
 Aphyllopodous or hypophyllopodous with less leafy stem. Lower leaves abruptly contracted to long petioles; median broader, elliptic, scarcely panduriform. Phyllaries narrower *H. denticulatum*.

184. *HIERACIUM PRENANTHOIDES* Villars, Prosp. 35 (1779); Fl. Delph. 85 (1785); Hist. Pl. Dauph. 108 (1789); Smith, Eng. Bot. no. 2235 (1810); Backh. Mon. 69 (1856); Fries, Epier. 118 (1862); Williams, l. c. 164 (1902); Hanb. in Bab. Man. ed. 9, 265 (1904); W. R. Lint. Brit. Hier. 85 (1905); *H. prenanthoides* subsp. *prenanthoides* Zahn, l. c. 749 (1921).

Icones.—Eng. Bot. t. 2235 (E. B. ed. 3, 858); Pl. 10, fig. b.

Essicc.—Groves, Glen Lochay, 1891; Ley, Taren yr Esgob, 1897; both in Hb. Mus. Brit.; Linton no. 48; Hanbury, Braemar, 1887, and Lawers Burn, 1888; Percival, Hawes, 1888; all in Hb. Hanbury.

Aphyllopodous. Stem 40–100 cm. high, robust or slender, glabrous below, becoming \pm pilose with dark-based hairs above, sometimes with a few glandular hairs intermixed. *Leaves* 12–30, dull green, paler with reticulate venation beneath; the *lowest oblong-spathulate*, obtuse-mucronulate, obscurely denticulate, *gradually contracted below to \pm short, broadly winged petioles*; the *median \pm lanceolate*, often *contracted below the middle and slightly dilated towards the semi-amplexicaul subcordate base* (thus forming a panduriform outline), *remotely denticulate with subentire, acute apex*; the upper ovate-lanceolate, acuminate, sometimes more strongly denticulate towards the semi-amplexicaul, cordate base; all \pm shortly pilose or glabrescent on both surfaces, with ciliate margins. *Inflorescence paniculate-corymbose*, many-(–60)-headed, with slender, erect-spreading, bracteolate branches, and sometimes also longer lower ones furnished with small leaves; the branches and peduncles *densely clothed with dark glandular hairs*, occasionally mixed with dark, spreading pilose hairs. *Heads small and narrow*, rounded below. *Phyllaries few*, almost in two series, an inner longer and an outer unequally shorter, incumbent in bud, dark olive-green, the innermost with paler margins, \pm *broad*, linear-oblong, obtuse, sparingly floccose, *with dense, dark, unequal glandular hairs*, epilose or rarely with a few dark pilose hairs intermixed. *Ligules pilose-tipped*. Styles livid. Margins of receptacle-pits elevated, incise-dentate. *Achenes fulvous or buff-coloured*, 3.25–3.5 mm. long.

This is one of the most distinct British hawkweeds, equally characteristic in its leafy stem with foliage recalling that of *Prenanthes purpurea*, its compound glandular panicle of small, glandular heads with pilose-tipped ligules, and its pale-coloured achenes. Although recorded for several vice-counties in Scotland and the North of England, it is curiously not cited for Britain by Zahn. Two Scottish stations, Fortingal and Braemar, are given by Zahn for the allied species *H. strictissimum* Froel., and one (Braemar) for *H. lanceolatum* Vill., but no British specimens of these plants have been seen. The varying examples of this group occurring in these stations are shown (in herbarium specimens) by their pale achenes to be forms of *H. prenanthoides*. In the last edition of the 'London Catalogue of British Plants' another closely related species, *H. subelatum* Alm., is also inserted for two vice-counties. A specimen from Clova in Herb. Backhouse was so named by Ley, but I think it is only a dwarf example of *H. prenanthoides* from an exposed habitat; and there is another from Brecon, similarly named, in Herb. Hanbury, which seems quite unlike Almquist's species. *H. prenanthoides* is recorded in Backhouse's Monograph for Garvagh, Co. Derry, but no Irish material has been seen.

Distribution.—42. Brecon: Taren yr Esgob (Ley). 57. Derby: Chee Dale (Painter). 64. M.W. Yorks: Settle (Tatham). Heseldon Glen! 65. N.W. Yorks:

Hawes (Cotton). Richmond (Ward). 67. Northumberland : Allen Bank (Hb. Soc. Bot. Lond.). 72. Dumfries : Corsrig and Sanquhar (Davidson). 79. Selkirk : Galashiels ! Ettrick Bridge End (E. S. Gregory). 88. Mid Perth : Strathfillan (Marshall). Lawers (Hanbury). Craig-an-lochan ! Killin ! Crianlarich (Hanbury). Lochearnhead (Buchanan-White). 89. E. Perth : Blairgowrie ! Glen Shee (Marshall). 90. Forfar : Clova (Gardiner). Bradoonie (Backhouse). Brechin (Balfour). Den of Airlie (Corstorphine). 92. S. Aberdeen : Braemar !

General Distribution.—French and Swiss Alps ! Scandinavia.

185. *HIERACIUM DENTICULATUM* Smith, Eng. Bot. no. 2122 (1810).

H. prenanthoides Sm. Fl. Brit. ii. 835 (1800), non Villars ; *H. Borreri* Syme, E. B. ed. 3, v. 212 (1866) ; Hanb. in Bab. Man. ed. 9, 265 (1904) ; *H. juranum* subsp. *pseudelatatum* Zahn, l. c. 778 (1921) ?

Icones.—Eng. Bot. t. 2122 ; E. B. ed. 3, t. 859, as *H. Borreri*.

Exsicc.—Syme, Balmuto (cult.), 1874 ; in Hb. Mus. Brit. and Hb. Hanbury ; Syme, eodem loco, 1874 ; Buchanan-White, Perth (cult.), 1888 ; both as *H. Borreri* in Hb. Hanbury.

Aphyllopodous or hypophyllopodous. Stem 30–100 cm. high, robust or slender, sparingly pilose. *Leaves* large, bright green, glaucescent and reticulate-veined beneath ; the *radical* few, *oblong to elliptic-lanceolate*, rounded-obtuse-mucronulate to acute, subentire to closely and irregularly denticulate, *shortly narrowed below to long*, sparingly hirsute *petioles* ; the *cauline* 6–12 (–17), *elliptic to ovate-lanceolate*, acute to shortly acuminate, *subentire to unequally sinuate-denticulate*, the lower shortly contracted to winged petioles, the median sessile and amplexicaul, the upper subcordate-based ; all \pm pilose, or sometimes glabrescent, on both surfaces, with shortly ciliate margins. *Inflorescence* *paniculate-corymbose*, many (–50)-headed, with slender, finely bracteolate, erect-spreading branches, clothed, like the peduncles, *with dense dark glandular hairs*. *Heads* *small and narrow*, rounded below. *Phyllaries* *few*, almost in two series, the inner longer with the outer unequally short, incumbent in bud, olive-green, linear-oblong, obtuse, floccose, especially on the margins, *with dense dark glandular hairs*, almost epilose. *Ligules* *pilose-tipped*. *Styles* livid. *Margins* of receptacle-pits elevated, subulate-dentate. *Achenes* *fulvous or buff-coloured*, 3.5–4 mm. long.

This plant is closely allied to *H. prenanthoides*, having a similar inflorescence, flower-heads and light-coloured achenes. It differs in its partially hypophyllopodous habit, in its broader basal leaves, much more abruptly contracted into distinct long petioles, and in its broader stem-leaves, which are subentire in weak plants but in luxuriant individuals become peculiarly sinuate-denticulate with a wavy margin closely interspersed with fine denticulations.

The history of this species is curious. It was first reported in Smith's 'Flora Britannica' (l. c.) as *H. prenanthoides* Vill., the description being taken from a garden specimen found originally by Dickson in Harehead Wood, near Selkirk, and communicated to T. Foster. Ten years later Smith, realizing that it was not Villars's plant, published a new account in 'English Botany' (No. 2122), with a plate, and changed its name to *H. denticulatum*. The plant continued under cultivation and was grown by Borrer, Watson, Syme and Buchanan-White. Syme judged from the specimens which he saw that Smith's description was taken from a plant subsequently referred to *H. strictum* Fr., which differed from the cultivated *H. denticulatum*. He therefore re-described and figured the garden plant in the third edition of 'English Botany' under the name of *H. Borreri*. At the same time he used Smith's figure of *H. denticulatum*, to which he added a piece of stem with narrow cauline leaves, taken from a different plant, to illustrate *H. strictum* Fr. On looking through the numerous sheets of exsiccatae now in Herb. Hanbury, obtained from Syme, Watson and

Buchanan-White, and named either *H. denticulatum* or *H. Borreri*, it is evident that they are all varying states of one species, and that *H. denticulatum* Sm. and *H. Borreri* Syme are conspecific. Buchanan-White's and Watson's specimens are much more vigorous than most of Syme's. Smith's figure depicts a piece of a normal strong branch and Syme's plate a weak example with subentire foliage.

There is no specimen of the Harehead Wood plant in Smith's herbarium, but a sheet there from 'Rannack [sic] in Perthshire, Mr. T. Mackay, 1796, no. 36' is annotated by Smith '*H. prenanthoides* Fl. Brit. *H. denticulatum* E. B. t. 2122'. This plant has broadly lanceolate, subentire leaves and an eglandular inflorescence of small heads, and does not agree either with the description or the figure of *H. denticulatum*. It cannot therefore be regarded as a type or even an authentic specimen.

Recent conditions have rendered impossible a thorough search in herbaria in order to trace whether *H. denticulatum* grows outside Great Britain, and I have been unable to find any foreign examples just like it. Zahn treats *H. denticulatum* Sm. 'ex expl. cult. leg. Watson' as a synonym of *H. juranum* Fr. subsp. *pseudelatum* Zahn, a plant of the Western Alps. But seeing that *H. prenanthoides* and forms of '*H. strictum*' are native in the south of Scotland, it seems possible that *H. denticulatum* too may have grown as a wild plant in Harehead Wood.

Distribution.—79. Selkirk : Harehead Wood (Dickson).

General Distribution.—Jura, Valais and Savoy ap. Zahn ?

Sect. X. TRIDENTATA.

Fries, *Epier.* 113 (1862) ; Williams, l. c. 83 (1902) ; Zahn, l. c. 856 (1921) ; *Rigida* Hanb. in Bab. Man. ed. 9, 261 (1904) ; W. R. Lint. Brit. Hier. 76 (1905).

Aphyllopodous, pseudophyllopodous or hypophyllopodous plants, rarely phyllopodous. Stem leafy, with green (never glaucous) foliage, the lower leaves \pm petiolate, the upper smaller and sessile ; leaf-margins generally thickened or revolute, often scaberulous (from deciduous or obsolete hair-bases) instead of ciliate. Inflorescence racemose- to paniculate-corymbose, with several—many, large—small heads. Phyllaries incumbent in bud (unless in *H. longiramosum*, *H. grandescens* and *H. nidense*), obtuse or subacute, usually with less clothing than in the Phyllopodous Sections, floccose, pilose and glandular in varying proportions but rarely densely glandular ; often also microglandular. Ligules glabrous-tipped. Styles yellow to livid. Margins of receptacle-pits \pm subulate-dentate (rarely fimbriate- or setaceous-dentate). Achenes blackish brown.

Flowering July-August, rarely in June.

A large number of British plants falls within this Section, which connects the Section *Vulgata* with the *Foliosu* and *Umbellata*. Several species allied to *H. gothicum* Fr. are conspicuous by their pseudophyllopodous habit and large, handsome heads with dark, nearly naked involucre. Other plants, equally distinct, with a similar habit and large heads with strongly pilose phyllaries are *H. substrigosum* and *H. donegalense*. Then *H. tridentatum* has a widely different facies from its tall, leafy stem and large panicle of small heads.

The Section has a very wide area of distribution, ranging over most of Europe, as well as northern Asia and North America. The species with us are mostly plants of Southern Britain, and particularly of Wales. Twenty-seven of the thirty-four species here described seem to be endemic. Eleven species grow in England, of which four are confined thereto. No less than nineteen species occur in Wales, whereof nine are endemic to the principality. Seven only are known in Scotland, all but three belonging to the Series *Gothica*, and two of these are not found elsewhere. In Ireland ten species have been distinguished, all except three (*H. uiginskyense*, *H. Backhouseanum* and *H. stictophyllum*) endemic to that country. The *Eu-Tridentata*

predominate in England and Wales, and the only specimen of these noted from Scotland or Ireland is one (*H. eboracense*) from the Outer Hebrides.

Series *Anomala* [Grex *H. hibernicum* Hanb.].

±Aphyllopodous plants, with long, slightly cut leaves, and normally few, rather large, dark heads in a racemose-corymbose panicle. Phyllaries obtuse, slightly floccose, pilose and glandular. Styles yellow.

- Plant relatively dwarf, with few lanceolate leaves. Heads always few, with broad, obtuse, phyllaries *H. cacuminum*.
 Plant taller, with numerous long, lanceolate leaves. Heads few (more numerous and smaller in var. *venniciorum*) with less broad phyllaries *H. hibernicum*.

Series *Gothica* [Grex *H. gothicum* Fr.].

Hypophyllopodous or pseudophyllopodous plants (unless in *H. fragilicaule*) with narrow (except in *H. cambrico-gothicum*), ±serrate leaves, and normally a racemose-corymbose panicle of few heads (except in *H. longiramosum* and *H. trinitatis*) of medium size to large (smaller in *H. fragilicaule*). Phyllaries ±broad, obtuse, dark, generally with little clothing.

* Stem-leaves gradually diminishing in size. Heads of medium size (except in *H. calcaricolum* and *H. fragilicaule*). Styles fuscous to livid.

- Pseudophyllopodous; inflorescence paniculate-corymbose, often with long branches from the leaf-axils. Phyllaries nearly glabrous, subcorrect in bud *H. longiramosum*.
 Hypophyllopodous, ±robust and hirsute with ±elliptic foliage; panicle relatively compact. Phyllaries normally sparingly glandular *H. cambrico-gothicum*.
 Hypophyllopodous, slender and less hirsute; panicle compact. Phyllaries densely glandular *H. borophilum*.
 Hypophyllopodous, slender with very small leaves; panicle compact. Heads rather large, with sparingly pilose and glandular phyllaries. *H. calcaricolum*.
 Hypophyllopodous to aphyllopodous, slender with small denticulate leaves and small panicle. Heads rather small, with nearly glabrous phyllaries *H. fragilicaule*.

** Stem leaves conspicuously diminishing in size. Panicle compact (unless in *H. trinitatis*). Heads rather large. Styles yellow.

- ±Pseudophyllopodous, slender and glabrescent, with serrulate leaves. Phyllaries glabrescent. Margins of receptacle-pits fimbriate-dentate *H. calviceps*.
 Pseudophyllopodous, glabrescent, with sharply serrate leaves. Phyllaries pilose *H. gothicoides*.
 Hypophyllopodous, slender and pilose, with denticulate leaves. Phyllaries very obtuse, finely pilose and microglandular. Margins of receptacle-pits dentate-fimbriate *H. uiginskyense*.
 Pseudophyllopodous, ±pilose, with floccose, serrate leaves with scaberrulous margins. Inflorescence paniculate-corymbose. Phyllaries finely pilose and microglandular *H. trinitatis*.

Series *Backhouseana* [Grex *H. Backhouseanum* (Zahn) Roffey].

Generally robust plants with ±broad foliage and ample panicle. Heads ±large; phyllaries broad, obtuse, dark, generally with little clothing.

- Pseudophyllopodous, with elliptic-lanceolate, denticulate leaves. Phyllaries ±pilose and glandular. Styles yellow to livid. Margins of receptacle-pits dentate-fimbriate *H. Backhouseanum*.
 Hypophyllopodous, with elliptic-lanceolate, dentate leaves and subracemose panicle. Phyllaries slightly glandular and pilose. Styles yellowish *H. pseudacrifolium*.
 Pseudophyllopodous, with broadly elliptic, denticulate leaves. Phyllaries microglandular, slightly glandular and pilose. Styles fuscous *H. Scullyi*.
 Pseudophyllopodous and rather slender, with subracemose panicle and elliptic, denticulate leaves. Phyllaries pilose, microglandular, sparingly glandular. Styles dull yellow. Margins of receptacle-pits long-setaceous-dentate *H. urdaricum*.
 Hypophyllopodous, tall with large, elliptic-lanceolate leaves typically with long, curved teeth. Heads very large: phyllaries finely glandular. Styles livid *H. Stewartii*.

Series *Sparsifolia* [Grex (polymorphus) *H. sparsifolium* Lindbg.].

Slender or robust plants, with narrow to broad leaves and lax or ample racemose- or paniculate-corymbose panicle. Heads \pm large (excepting *H. Hartianum*); phyllaries broad, obtuse, generally \pm pilose.

* Usually aphyllopodous (except *H. stictophyllum*) and \pm slender (except *H. oligodon* and *H. linguans*). Leaves \pm narrow, little toothed. Phyllaries not densely pilose.

- Leaves long-lanceolate, subentire. Panicle ample. Phyllaries pilose, short-glandular and microglandular. Styles livid *H. subintegrifolium*.
Often pseudophyllopodous. Leaves linear-lanceolate, typically subentire, normally spotted. Panicle usually ample. Phyllaries \pm pilose, glandular and microglandular. Styles yellow *H. stictophyllum*.
Leaves linear-oblong, \pm denticulate. Panicle few-flowered, lax. Phyllaries pilose and glandular. Styles fuscous *H. sparsifolium*.
Leaves oblong to lingulate, subentire or with few, blunt teeth. Panicle few-flowered, lax. Phyllaries sparsely pilose and glandular. Styles yellow *H. oligodon*.
Leaves oblong, with few, blunt teeth. Panicle lax. Phyllaries densely floccose, \pm pilose and glandular. Styles fuscous. Margins of receptacle-pits dentate-fimbriate *H. linguans*.

** Robust plants, with broader, more toothed leaves. Panicle ample. Phyllaries \pm densely pilose.

- Hypophyllopodous, tall with elliptic-lanceolate, coarsely toothed, hirsute leaves. Panicle and phyllaries densely pilose. Styles yellow *H. substrigosum*.
Pseudophyllopodous, with elliptic-lanceolate, sharply serrate leaves. Panicle elongate; phyllaries pilose and short-glandular. Styles fuscous *H. donegalense*.
Aphyllopodous, with lingulate-lanceolate, \pm dentate leaves. Panicle with short accladium; phyllaries densely pilose, \pm porrect in bud. Styles livid *H. grandescens*.
 \pm Aphyllopodous, with lanceolate, coarsely toothed leaves attenuate below. Phyllaries dark, densely pilose, \pm glandular. Styles yellow to fuscous *H. placcrophylloides*.
 \pm Aphyllopodous, with elliptic-lanceolate, unequally dentate leaves. Heads of medium size; phyllaries dark, \pm pilose and microglandular. Styles yellow. Margins of receptacle-pits long-setaceous-dentate . *H. Hartianum*.

Series *Eu-Tridentata* [Grex *H. tridentatum* Fr.].

Robust, generally tall, aphyllopodous plants, with leafy stem, dentate foliage and paniculate-corymbose, \pm floriferous inflorescence. Heads small to medium (larger in *H. nidense*); phyllaries usually relatively narrow, obtuse to subacute.

* Heads small to medium.

- Leaves \pm elliptic-lanceolate, \pm deeply dentate. Heads pale, small, narrow, subtruncate-based; phyllaries pilose and glandular. Styles yellow to livid *H. tridentatum*.
 \pm Pseudophyllopodous; leaves oblong-lanceolate, coarsely serrate. Panicle subumbellate. Heads darker, of medium size, rounded below; phyllaries chiefly glandular. Styles livid *H. scabrisetum*.
Leaves elliptic-oblong, obtusely dentate. Heads small, rounded below; phyllaries broader, \pm pilose and glandular. Styles yellow *H. cantianum*.

** Heads medium to rather large.

- Leaves long, lanceolate, sharply serrate. Panicle lax, racemose-corymbose, few-headed. Heads rather large, narrowed below; phyllaries glandular and slightly pilose, subporrect in bud. Styles livid *H. nidense*.
Leaves elliptic-lanceolate, \pm coarsely dentate. Heads of medium size, \pm rounded below; phyllaries \pm finely pilose and short-glandular. Styles yellow to fuscous *H. trichocaulon*.
Leaves elliptic-lanceolate, sharply and irregularly toothed. Heads of medium size, rounded below; phyllaries pilose and \pm glandular. Styles fuscous to livid. Margins of receptacle-pits long-setaceous-dentate *H. eboracense*.
Leaves lanceolate, sparsely toothed. Heads of medium size or larger, rounded below; phyllaries finely glandular, epilose. Styles yellow *H. rhyaderense*.

*** Leaves narrow, recalling those of Section *Foliosa*.
Heads small to medium.

Aphyllopodous. Stem glabrescent. Leaves narrowly lanceolate, little toothed. Phyllaries epilose and eglandular. Styles fuscous to livid *H. lissolepium*.

Series **Anomala**. (See page 234.)

186. *HIERACIUM CACUMINUM* (Ley) Ley in Journ. Bot. xlvii. 51 (1909); *H. diaphanum* var. *cacuminum* Ley, l. c. xxxiii. 86 (1895); *H. vulgatum* var. *cacuminum* Hanb. in Bab. Man. ed. 9, 258 (1904); *H. demissum* var. *cacuminum* W. R. Lint. Brit. Hier. 74 (1905); *H. angustatum* subsp. *cacuminum* Zahn, l. c. 471 (1921).

Essicc.—Ley, Brecon Beacons, 1890; Ley and Shoolbred, eodem loco, 1894; Linton no. 116, as *H. diaphanum* var. *cacuminum*; all in Hb. Mus. Brit.; Ley, Craig Gledsiau, 1890, and Cwm Tarrell, 1883 and 1888; all in Hb. Hanbury.

Aphyllopodous or *pseudophyllopodous*, with slender rootstock producing thin, flexuous shoots, from which rise slender stems, 15–35(–50) cm. high, often reddish below, pilose, chiefly about the nodes of the lower leaves, and somewhat floccose above, with scattered, spreading pilose hairs. *Leaves* few (4–6), dull, bluish green, all but the highest often forming a false rosette near the base of the stem; the earliest small, oval, obtuse-mucronulate, subentire, shortly cuneate-based with rather long petioles, the median long, lanceolate, acuminate, with distant denticulations or fine (sometimes cusped) teeth, gradually attenuate below to winged, semi-amplexicaul petioles, the uppermost linear-lanceolate, subentire, sessile, sometimes spreading as in *H. argenteum*; all glabrescent above, and ± sparingly pilose with rather stiff hairs beneath and on the petioles, margins ciliate. *Inflorescence* racemose-corymbose, 1–3(–5)-headed, with straight, suberect branches, peduncles floccose, with scattered (or sometimes numerous) long, dark-based, spreading pilose hairs. *Heads* of medium size or rather large, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, the inner with paler margins, few, broad, lanceolate, obtuse, sparingly floccose below, with ± numerous dark-based pilose hairs and some fine, dark glandular hairs intermixed. *Ligules* glabrous-tipped. *Styles* yellow. Margins of receptacle-pits sharply dentate. *Achenes* blackish, 3.5–4 mm. long.

This rare plant, which grows on turfey ledges of rocks on the central cliff of the Brecon Beacons, on Craig Gledsiau, and on streamside rocks in Cwm Tarrell, is very distinct in its slender, flexuous habit, and its few-headed cyme of dark heads with very broad phyllaries. Many of the numerous wild specimens collected show no approach to a phyllopodous habit, but the more vigorous plants often have most of their leaves aggregated in a loose rosette near the base of the stem. As might be expected, the specimens from Cwm Tarrell, where it seems to have been first collected by Ley in 1883, are taller and more luxuriant than the mountain examples.

The plant was first referred by Lindeberg to *H. lapponicum* Fr., as a form with larger leaves and more clothed involucres, but it is sufficiently distinguished from this species by its flexuous habit and broader, more petiolate foliage. Subsequently it was associated with *H. diaphanum* Fr., *H. argenteum* Fr., *H. vulgatum* Fr. and *H. demissum* Strömf. It shows but little affinity with any of these plants and seems to be best treated as an anomalous species of the Section *Tridentata*.

Distribution.—42. Brecon: Beacons, Craig Gledsiau and Cwm Tarrell (Ley).

Endemic.

187. *HIERACIUM HIBERNICUM* F. J. Hanbury in Journ. Bot. xxx. 258 (1892); Prager, l. c. 308; Hanb. in Bab. Man. ed. 9, 249 (1904); W. R. Lint. Brit. Hier. 33

(1905); *H. argenteum* Hart in Journ. Bot. xxiv. 48 (1886); *H. norvegicum* subsp. *hibernicum* Zahn, l. c. 279 (1921).

Exsicc.—Hart, Broughnamaddy, Mourne Mts., 1883; Stewart and Praeger, eodem loco, 1889, and cult. 1890 and 1891; all in Hb. Dublin; Hanbury, Mourne Mts., 1891, in Hb. Hanbury.

Plant apparently *aphyllopodous*, with flexuous, rather slender stem, 30–60 cm. high, purple-tinted below, nearly glabrous or with scattered pilose hairs towards the base, and \pm floccose above. Radical rosette wanting; *cauline leaves* 7–10, dull, glaucescent green, paler beneath; the lowest oblong, obtuse-mucronate, remotely denticulate, gradually narrowed below to \pm long, winged, half-clasping petioles; median larger (to 15 cm. long), narrow- or linear-lanceolate, acute, remotely denticulate or with 2–3 fine, sharp teeth on each side, \pm attenuate below; upper successively decreasing to bracts, linear-lanceolate, acuminate, subentire, shortly narrowed below, sessile; all nearly glabrous, or shortly pilose (rarely also subfloccose) beneath and on the petioles, with the thickened margins minutely ciliate and scaberulous. *Inflorescence* racemose-corymbose, 1–3(–6, cult.)-headed, with slender, bracteolate, floccose, eglandular and almost epilose peduncles. *Heads* rather large, \pm truncate-based. *Phyllaries* incumbent in bud, dark green, linear-oblong, obtuse, sparingly floccose (chiefly on the margins), with a few short, black-based pilose and more numerous dark glandular hairs. Ligules glabrous-tipped. *Styles* yellowish. Margins of receptacle-pits serrate-dentate. Achenes blackish, 4 mm. long.

β . venniciorum var. nov.

Icon.—Pl. 16, fig. a.

Exsicc.—Hart, Moynalt, near Laghy, S.W. Donegal (type), in Hb. Dublin; Hart, Laghy, 1883, in Hb. Hanbury.

Caulis interdum inferne pilis patentibus magis hirsutus. *Anthela* nonnunquam multi-(–22)-cephala; *capitula* quam in typo minora magis pilosa.

Stem sometimes more hirsute below with spreading pilose hairs. Inflorescence sometimes many-(–22)-headed; heads smaller and more pilose than in the type.

This plant was first collected in 1883 by H. C. Hart at Broughnamaddy, in the Mourne Mountains, near Rostrevor, Co. Down. The specimens were referred for determination to Backhouse and Babington, who thought them to be a remarkable form of *H. argenteum* Fr. It was again collected at the same station in 1889 by Stewart and Dr. Praeger, and in 1891 by Hanbury, who a year later described it (l. c.) as a new species *H. hibernicum*. This description is stated to cover the form from Down and another found by Hart in Donegal, but Hanbury does not appear to have seen the more hirsute and many-headed specimens from the latter station now in Herb. Dublin, which differ considerably from the plant of the Mourne Mountains and may be found, when better material is available, to constitute a separate species. Other somewhat similar forms, with medium-sized or rather small heads, were collected by Hart by the Owengarve river, near Martin's Bridge, Glenties, Co. Donegal.

The taxonomic position of this rare species is rather obscure. It was at first regarded as an ally of *H. argenteum* and was treated both by Hanbury and W. R. Linton as a member of the Section *Oreadea*, although Lindeberg, to whom an example was sent, noted in it a resemblance to the *Rigida* (*H. Friesii* Hartm.). Judging from the material at Dublin (eleven sheets in all) and in Herb. Hanbury, the plant seems to be *aphyllopodous*, and I can see in it but little trace of *Oreadean* hair-clothing, the foliage generally showing the scaberulous, thickened margins characteristic of *H. rigidum* Hartm. or *H. umbellatum* L. On the whole, the plant seems to be best treated as belonging to the Section *Tridentata*.

There is a specimen in Herb. Mus. Brit., collected by T. A. Cotton in 1891 in Upper Wharfedale, Yorks, which was named *H. hibernicum* by Hanbury. It is a rather small, slender plant with leafy stem and dark heads, the phyllaries broad and nearly glabrous. The identification is by no means certain.

Distribution.—Ireland. 38. Down : Mourne Mts. (Hart).

var. *venniciorum*.

35. W. Donegal : Laghy (Hart).

Endemic.

Series **Gothica**. (See page 234.)

188. *HIERACIUM LONGIRAMOSUM* sp. nov.

Exsicc.—Griffiths, Nant Francon, 1893 (type), in Hb. Hanbury and Hb. Mus. Brit.

Planta pseudophyllopoda. *Caulis* 25–40 cm., gracilis, flexuosus, ad basin parce pilosus, superne glabrescens vel anthelam versus leviter floccosus. *Folia parva*, saturate viridia; basalia in rosulam spuriam aggregata, *caulina* 6–9; basalia ovalia ad elliptico-vel ovato-lanceolata, obtuso-mucronata ad acuta, remote denticulata ad serrata, inferne in petiolum brevem alatum contracta; *caulina lanceolata* vel suprema linearia, leviter sed *sparsae serrata* ad integra, acuminata, basi \pm cuneatâ sessilia; omnia *superne glabrescentia*, inferne parce pilosa, marginibus leviter et irregulariter ciliatis. *Anthela paniculato-corymbosa*, 7–25-*cephala*, *ramis* superioribus flexuosis acladium superantibus et plerumque *inferioribus longis* e foliorum caulinatorum plurimorum axillis; pedunculi flocculosi. *Involucra mediocria*, basi subtruncata. *Squamae in gemmis subporrectae, atrovirides, latiusculae*, lineari-lanceolatae, obtusae, *glabrae* vel nonnunquam pilis minutis sparsis microglandulisque obsitae. Ligulae apice glabrae. *Styli lividi*. Alveoli receptaculi margine inciso-dentati.

Pseudophyllopodous. *Stem* 25–40 cm. *high*, slender, flexuous, sparingly pilose about the base, glabrescent above or slightly floccose towards the inflorescence. *Leaves small*, dark green, the basal aggregated in a false rosette, the *cauline* 6–9; basal oval to elliptic- or ovate-lanceolate, obtuse-mucronate to acute, remotely denticulate to serrate, contracted below to short, winged petioles; *cauline lanceolate* or the uppermost linear, finely but *distantly serrate* to entire, acuminate, sessile with \pm cuneate base; all *glabrescent above*, sparingly pilose beneath, with slightly and irregularly ciliate margins. *Inflorescence paniculate-corymbose*, 7–25-headed, with flexuous upper branches exceeding the acladium and usually *long lower branches* from the axils of most of the *cauline* leaves; peduncles flocculose. *Heads of moderate size*, subtruncate-based. *Phyllaries subporrect in bud*, blackish green, rather broad, linear-lanceolate, obtuse, *glabrous* or sometimes with scattered minute pilose hairs and microglands. Ligules glabrous-tipped. *Styles livid*. Margins of receptacle-pits incise-dentate. Achenes blackish brown, nearly 4 mm. long.

This remarkable plant is represented by eight good specimens in Herb. Hanbury sent by J. E. Griffiths in 1893 as *H. gothicum*. There are other examples of the same gathering in Herb. Mus. Brit. Elfstrand, commenting upon it, remarked that its stem-leaves recalled the *Rigida*, its root-leaves the *Vulgata*, and its phyllaries the *Foliosa*, and suggested that it should be separated as a species. It has since remained in Hanbury's herbarium as 'a form between *gothicum* and *sparsifolium*'. The character of the phyllaries seems to recall the *Gothica* rather than the *Foliosa*, while the much branched habit resembles that sometimes seen in *H. substrigosum* but is sometimes more extreme. The plant appears to be best dealt with as a new species of the *Gothica*. It is desirable that it should be refound in Nant Francon.

Distribution.—49. Carnarvon : Nant Francon (Griffiths).

Endemic.

189. *HIERACIUM CAMBRICO-GOTHICUM* sp. nov.

Exsicc.—Pugsley no. 800 (type), in Hb. Pugsley.

Planta hypophyllopoda. *Caulis* 20–40 (–100, in cultis) cm., *robustus*, *inferne dense*

pilosus, anthelam versus \pm floccosus. *Folia* obscure viridia; basalia ovali-elliptica, \pm obtusa, irregulariter denticulato-dentata, in petiolum brevem late alatum angustata; *caulina* 10-15(-25, cult.), sursum mox minora, inferiora *elliptica ad ovato-lanceolata*, acuta ad acuminata, inaequaliter serrato-denticulata, sessilia, basi breviter cuneata ad rotundata, reliqua angustiora, longe acuminata, dentibus paucis majoribus praedita; omnia *superne glabrescentia inferne pilosa*, vel utrinque pilosa, in paginâ inferiore (saltem in foliis summis) dense floccosa; marginibus ciliatis. *Anthela racemoso-corymbosa*, 5-12-*cephala* (in cultis -40, tandem paniculato-corymbosa), saepe apice subumbelliformis, *ramis strictis erecto-patulis* acladium superantibus; pedunculis floccosis apice incrassatis, 2-3-bracteolatis. *Involucra mediocria*, basi truncata. *Squamae* (exteriores \pm laxae) atrovirides, satis latae, lineari-lanceolatae, obtusae, fere effloccosae, epilosae, ad medium glandulis paucis obscuris obsitae. Ligulae apice glabrae. *Styli fusci*. Receptaculi alveoli margine inciso-dentati.

Hypophyllopodous. Stem 20-40(-100, cult.) cm. high, robust, densely pilose below, becoming \pm floccose upwards. *Leaves* deep green; the basal oval-elliptic, \pm obtuse, irregularly denticulate-dentate, contracted to short, broadly winged petioles; the *cauline* 10-15(-25, cult.), quickly becoming smaller upwards, the lower *elliptic to ovate-lanceolate*, acute to acuminate, irregularly serrate-denticulate, sessile with shortly cuncate to rounded base, the upper narrow, long-acuminate, with few, coarser teeth; all *glabrescent above and pilose beneath*, or pilose on both surfaces, the lower side (at least of the upper leaves) also densely floccose; margins ciliate. *Inflorescence racemose-corymbose*, often apically subumbellate, 5-12-headed (at length paniculate-corymbose, -40-headed, cult.), with straight, erect-spreading branches exceeding the acladium; peduncles floccose, thickened above, with 2-3 linear bracteoles. *Heads of medium size*, truncate-based. *Phyllaries* incumbent in bud (the outer \pm lax), blackish green, rather broad, linear-lanceolate, obtuse, almost effloccose and epilose, with a few dark glandular hairs along the median line. Ligules glabrous-tipped. *Styles fuscous*. Margins of receptacle-pits incise-dentate. Achenes blackish brown, about 4 mm. long.

β . glandulosum var. nov.

Exsicc.—Riddelsdell, Aberafan, 1904 (type), and Port Talbot, 1907; both in Hb. Mus. Brit.; Pugsley no. 801, in Hb. Pugsley.

Folia angustiora, magis lanceolata. Pedunculi glandulis obscuris \pm numerosis pilisque basi atratis obsiti. Squamae paulo angustiores, inferne leviter floccosae, glandulis multis \pm longis obscuris microglandulisque vestitae. Aliter ut in typo.

Leaves narrower, more lanceolate. Peduncles with \pm numerous dark glandular and dark-based pilose hairs. Phyllaries rather narrower, slightly floccose below and with many long, unequal, dark glandular hairs and microglands.

The identification of *H. gothicum* Fr., like *H. caesium* and some other species of Fries, is ambiguous, and various differing forms have been referred to it by Continental and British authors. Dahlstedt (Bidrag, iii. 182) first furnished it with an adequate description, sending out sets of exsiccatae in agreement therewith (H. Sc. xi. 72-75); and his interpretation of the name has been followed by Zahn (l. c. 862). It is considered that this view of the species should be adopted. There are excellent specimens at Kew of Dahlstedt's *H. gothicum*, showing it to be a well-marked plant, possessing broad, deeply-cut foliage and the peculiar character of the phyllaries emphasized by Fries.

Backhouse applied the name *H. gothicum* in a wide sense, and both Hanbury and W. R. Linton have followed him in treating it as representing a British plant. Zahn, in his account, also cites 'Scotland! Shetland. England' among its habitats, from which it would appear that he had seen a Scottish specimen. Among the British material examined, however, I have failed to trace any example identical with Dahlstedt's exsiccatae, and *H. gothicum* Fr. emend. Dahlst. cannot therefore be admitted, on present evidence, as a British species, in spite of Zahn's citation,

Specimens somewhat like Dahlstedt's but with narrower, pilose phyllaries (now in Herb. Mus. Brit.) were obtained by Cryer at Silverdale, N. Lanes. in 1912, and at Ingleton in 1924.

H. cambrico-gothicum differs from *H. gothicum* in its coarser growth with more foliaceous stem, which becomes especially evident under cultivation; also in its much less dentate leaves and its more numerous and smaller heads. This plant was first collected at Llanfairfechan, Carnarvon, in 1903, and again in 1921 and 1922; and has been under cultivation since the last-named date. The variety *glandulosum*, which I found on Baglan Sandhills, Glamorgan, in 1935, was collected by Riddelsdell in 1904 at Aberafan, in the same county, and subsequently at Port Talbot and in Breconshire. His specimens were identified by Ley with *H. boreophilum* Zahn (*H. septentrionale* Arv.-Touv.) but they differ from this species in their more robust and more hirsute habit, with more stem-leaves, and in their rather more numerous but smaller heads.

An allied form, *H. conspersum* Dahlst. (*H. laevigatum* subsp. *subconspersum* Zahn), is inserted by Roffey in the London Catalogue for two British vice-counties although not given as British by Zahn. Dahlstedt's *exsiccatae* (H. Sc. xi. 76 and 77) at Kew show a plant with *vulgatum*-like foliage and dark, glandular heads. The two sheets in Herb. Hanbury under this name (one Irish) appear to be only shade-forms of *H. vulgatum*.

Distribution.—49. Carnarvon : Llanfairfechan !

var. *glandulosum*.

41. Glamorgan : Baglan ! Aberafan and Port Talbot (Riddelsdell). 42. Brecon : Dolgaer (Ley). Cellwen (Riddelsdell).

Endemic.

190. HIERACIUM BOREOPHILUM (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. melanocephalum Lindbg. H. Sc. Exs. iii. 137 (1878), non Tausch (1828); *H. septentrionale* Arv.-Touv. Hier. Alp.-Fr. 86 (1888), non Norrl. (1884), nec W. R. Lint. (1905); *H. laevigatum* subsp. *boreophilum* Zahn, l. c. 863 (1921).

Exsicc.—Lindbg. H. Sc. iii. 137; Syme, Glen Devon, 1876, in Hb. Hanbury.

Phyllopodous or *hypophyllopodous*. Stem (10–)15–30(–40) cm. high, slender, reddish towards the base, pilose, especially below, and ±floccose above. Leaves bright green; the radical elliptic-lanceolate, acute, with a few, fine, unequal, sometimes patent teeth, attenuate below to ±short petioles; cauline 4–8(–10), the lower resembling the basal (sometimes more coarsely toothed) but more shortly petioled or sessile, the upper smaller and narrower, acuminate, remotely toothed or denticulate, sessile and sometimes rounded below; all pilose on both surfaces or glabrescent above, with ciliate margins. Inflorescence compactly racemose-corymbose, 1–10(–15)-headed, with straight, erect-spreading branches exceeding the accladium, peduncles floccose with ±numerous, dark glandular and longer pilose hairs. Heads of medium size, subtruncate-based. Phyllaries (incumbent in bud) blackish green, linear-lanceolate, obtuse, scarcely floccose or pilose, with many long and shorter, dark glandular hairs and microglands. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3 mm. long.

This species is closely allied to *H. gothicum* Fr., as understood by Dahlstedt and Zahn, but is a dwarfier plant, with normally less deeply cut foliage and smaller, more glandular heads. As *H. septentrionale* Arv.-Touv. it was first brought into the British list (with a variety *amphibolum* (*H. vulgatum* var. *amphibolum* Lindbg.)) in W. R. Linton's handbook (p. 69), where the typical plant was recorded for Yorks,

Hereford and Brecon, and the variety for Carmarthen and Glamorgan. No Yorkshire specimens have been seen, but there are examples so named in Herb. Hanbury, collected by Ley at the Welsh stations. These plants are not identical with authentic material either of *H. melanocephalum* or of *H. vulgatum* var. *amphibolum* of Lindeberg, but they seem to be homogeneous and undescribed, and will be treated as a new species (*H. fragilicaule*) of the present group. In the Llanwrtyd valley, in Brecon, this undescribed plant seems to grow in company with *H. subminutidens* and to have been confused with it. The two species were mixed in Linton's exsiccata no. 67, as was noticed by Zahn, and the sheet of this number in Herb. Hanbury shows the same two plants. Hanbury's sheet of Linton no. 183 (as *H. septentrionale* var. *amphibolum*) has two untypical plants of *H. subminutidens*.

The only unmistakable British *H. boreophilum* that has been observed was obtained by Syme in 1876 at Glen Quay, Glen Devon, Perthshire, and there is a good series of this plant in Herb. Hanbury. There is also an example there (and in Herb. Mus. Brit.), with more numerous, smaller heads, collected by W. H. Painter in 1890 at Dolbenmaen, Carnarvon, which was named *H. septentrionale* by Arvet-Touvet himself. This plant does not seem identical with *H. boreophilum* though apparently allied to it. A somewhat similar form was found in Cwm Llebrith by J. W. Lloyd Williams.

Distribution.—87. W. Perth : Glen Devon (Syme).

General Distribution.—Norway.

191. *HIERACIUM CALCARICOLUM* (F. J. Hanbury) Roffey in Lond. Cat. ed. 11 (1925). *H. rigidum* var. *calcaricolum* Hanb. in Journ. Bot. xxxii. 231 (1894) ; W. R. Lint. Brit. Hier. 84 (1905) ; *H. laevigatum* subsp. *calcaricolum* Zahn, l. c. 884 (1922).

Exsicc.—Fox, Stroud, 1890, in Hb. Hanbury.

Hypophyllopodous. *Stem* 25–35 cm. high, slender, flexuous, purplish, pilose, densely so towards the base. *Leaves* small, gradually decreasing upwards, *suberect*, olive-green, often suffused with purple ; the radical few, elliptic-lanceolate, subacute to acute, remotely serrate or serrulate, attenuate below to very short, winged petioles ; the *cauline* 8–12, elliptic-lanceolate to lanceolate, acute to acuminate, *remotely serrate*, sessile with shortly cuneate to rounded base (uppermost very small, linear-lanceolate, bractlike) ; all *glabrescent above*, *pilose*, and floccose *beneath*, with ciliate or scaberulous margins. *Inflorescence* racemose-corymbose, 1–3(–8)-headed, with short *accladium* and branches, peduncles slender, floccose, sometimes with occasional dark pilose hairs. *Heads* rather large, rounded below. *Phyllaries* incumbent in bud, *blackish green*, rather broad, linear-lanceolate, obtuse, with scattered dark glandular and longer pilose hairs, very sparingly floccose and microglandular. *Ligules* glabrous-tipped. *Styles* livid. *Margins of receptacle-pits* setaceous-subulate-dentate. *Achenes* blackish brown, about 3 mm. long.

This plant, distinct in its slender growth, very small foliage, and few large, dark heads, was discovered by H. E. Fox in 1890 on the limestone near Stroud, Gloucestershire. It is well represented in Herb. Hanbury. Although originally described as a variety of *H. rigidum* Hartm., it seems more nearly related to *H. gothicum* owing to its hypophyllopodous habit and its small panicle of large, sparsely clad heads ; and it most closely resembles *H. boreophilum*, which differs in its less numerous but relatively larger leaves and its rather smaller heads with much more glandular phyllaries.

A plant collected by Mr. A. Wilson in 1894 on slate at Howgill, near Sedbergh, N.W. Yorks (now in Herb. Hanbury) seems conspecific with *H. calcaricolum*, differing only in its taller stature with more numerous and rather larger leaves. Another

specimen, collected by Hart by the Carrick river, Donegal, and now in the Dublin Museum, may also belong here, but its present condition is too poor for a certain determination.

There are early specimens from St. Vincent's Rocks, Bristol, in Herb. Mus. Brit. and Herb. Hanbury, collected by John Ball (1848), Thwaites and others, which seem separable from the Stroud plant only by their smaller heads. These examples appear to have been overlooked by later botanists and were unknown to White. The plant has probably become extinct.

Distribution.—33. E. Glo'ster : Stroud (Fox).

Endemic.

192. *HIERACIUM FRAGILICAULE* sp. nov.

H. septentrionale var. *amphibolum* W. R. Lint. Brit. Hier. 69 (1905), non *H. vulgatum* var. *amphibolum* Lindbg. H. Sc. Exs. iii. 132 (1878) ; *H. angustatum* subsp. *amphiboloides* Zahn, l. c. 471 (1921) ?

Exsicc.—Ley, Glyn Corwg, 1890 (type), and Abergwesyn, 1890 ; Linton no. 67 (Llanwrtyd), partim ; all in Hb. Hanbury.

Planta hypophyllopoda vel aphyllopoda. *Caulis* 20–40(–50) cm., flexuosus, *gracilis*, inferne pilis patentibus dense pilosus, sursum glabrescens. *Folia parva*, dilute viridia, 6–12 caulina, basalia caulinaque inferiora obovata ad ovalia, obtuso-mucronulata ad subacuta, subintegra ad remote denticulata, inferne ad petiolum gracilem attenuata, caulina media et superiora lanceolata, acuta ad acuminata, dentibus paucis tenuibus vel remote denticulata, basi breviter contracta sessilia ; omnia utrinque pilosa vel superne glabrescentia, marginibus \pm ciliatis. *Anthela racemoso-corymbosa*, 1–10-cephala, ramis longiusculis, gracilibus, suberectis praedita ; pedunculi pilis glandulisve paucis subsolitariis \pm floccosi. *Involucra mediocria vel satis parva*, basi subtruncata. *Squamae atrovirides, latiusculae*, lineari-lanceolatae, obtusae, vix floccosae, glandulis obscuris nonnullis pilisque solitariis immixtis. Ligulae apice glabrae. *Styli fusci*. Receptaculi alveoli margine subulato- vel fimbriato-dentati.

Hypophyllopodous or aphyllopodous. *Stem* 20–40(–50) cm. high, slender, flexuous, densely pilose with spreading hairs below, becoming glabrescent upwards. *Leaves small*, dull or light green, 6–12 cauline, the basal and lowest cauline obovate to oval, obtuse-mucronulate to subacute, subentire to remotely denticulate, attenuate below to slender petioles, median and upper cauline lanceolate, acute to acuminate, with a few, fine teeth or remotely denticulate, sessile with shortly contracted base ; all pilose on both surfaces or glabrescent above, with \pm ciliate margins. *Inflorescence racemose-corymbose*, 1–10-headed, with rather long, slender, suberect branches, peduncles \pm floccose with a few scattered pilose or glandular hairs. *Heads of medium size or rather small*, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, rather broad, linear-lanceolate, obtuse, scarcely floccose, with some dark glandular and occasional solitary pilose hairs intermixed. *Ligules* glabrous-tipped. *Styles fuscous*. Margins of receptacle-pits subulate- or fimbriate-dentate. *Achenes* blackish brown, 3–3.5 mm. long.

f. *subhirsutum* forma nova.

Exsicc.—Ley, Ystrad ffin, 1890 (type), in Hb. Hanbury.

Pedunculi squamaeque pilis longis \pm numerosis vestiti. Aliter ut in typo.

Peduncles and phyllaries with \pm numerous long pilose hairs. Otherwise as in the type.

As already noticed, this species has been confused with *H. boreophilum*, and with *H. vulgatum* var. *amphibolum* Lindbg. Its identity with the latter seems to have been first suggested by Elfstrand. Lindeberg's variety clearly differs in its fewer

(3-4) stem-leaves, which are more sharply toothed and floccose beneath, and in its larger heads with more pilose and glandular phyllaries.

H. fragilicaule is apparently widely distributed in South Wales and, as a relatively inconspicuous plant, has perhaps been frequently overlooked.

Distribution.—9. Dorset : Studland (R. P. Murray). 41. Glamorgan : Glyn Corwg (Ley). 42. Brecon : Llanwrtyd and Abergwesyn (Ley). 44. Carmarthen : Tysgottwr (Ley).

f. *subhirsutum*.

42. Brecon : Abercrave (Ley). 46. Cardigan : Ystrad ffin (Ley).

Endemic.

193. *HIERACIUM CALVICEPS* sp. nov.

Exsicc.—Mennell, Winch Bridge, 1886, as *H. gothicum* (type) ; Kidston, Denny, 1893 ; R. F. Thompson, Settle, 1888 ; Fox, Codall Tarn, 1888 ; all in Hb. Hanbury.

Planta pseudophyllopoda vel aphyllopoda. *Caulis* 20-45 cm., *gracilis, strictus, glabrescens*, basin versus rubicundus. *Folia* pallide vel caesio-viridia, saepe rubro-centonata ; basalia, si adsint, ovalia ad oblonga, obtuso-submucronulata ad subacuta, subintegra, inferne in petiolum brevem ciliatum angustata ; *caulina* 6-10(-15), infima nunc basalibus intimis subsimilia, nunc acuta, serrulata, basi abrupte angustata sessilia ; media *lanceolata ad ovato-lanceolata*, acuta ad acuminata, \pm irregulariter serrulata, basi latâ vel rotundatâ sessilia ; summa ovato-lanceolata ad lanceolata, acuminata, saepius subintegra, sessilia, *sensim parvula bractaeiformia* ; omnia *superne glabrescentia*, inferne glabrescentia vel parce pilosa, leviter floccosa, inferiora saltem marginibus breviter ciliatis. *Anthela compacte racemoso-corymbosa*, 1-5(-8, vel -15 in cultis)-*cephala*, acladio brevi ramisque strictis, suberectis ; pedunculis sparsim floccosis. *Involucra majuscula*, basi subtruncata. *Squamae atrovirides, c basi latâ angustatae, \pm lineari-lanceolatae*, obtusae, plerumque *efloccosae, epilosae, eglandulosae*. Ligulae apice glabrae. *Styli lutei*. *Receptaculi alveoli margine dentato-fimbriati*.

Pseudophyllopodous or aphyllopodous. *Stem* 20-45 cm. high, slender, strict, glabrescent, reddish towards the base. *Leaves* pale or caesious green, often suffused with red ; the basal (when produced) oval to oblong, obtuse-submucronulate to acute, subentire, narrowed below to short, ciliate petioles ; *cauline* 6-10(-15), the lowest sometimes resembling the inner basal, sometimes acute, serrulate and sessile with abruptly narrowed base, the median *lanceolate to ovate-lanceolate*, acute to acuminate, \pm irregularly serrulate, sessile with broad or rounded base, the upper ovate-lanceolate to lanceolate, acuminate, generally subentire, sessile, becoming small and bractlike ; all *glabrescent above*, glabrescent or sparingly pilose, and slightly floccose beneath, the lower at least with shortly ciliate margins. *Inflorescence compactly racemose-corymbose*, 1-5(-8, or -15 cult.)-headed, with short acladium and straight, suberect branches, peduncles sparingly floccose. *Heads* rather large, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, broad below and narrowing upwards, \pm linear-lanceolate, obtuse, usually *efloccose, epilose and eglandular*. Ligules glabrous-tipped. *Styles yellow*. *Margins of receptacle-pits dentate-fimbriate*. Achenes blackish brown, about 3 mm. long.

β . *robustum* var. nov.

Exsicc.—Hanbury, Settle, 1891 (type), in Hb. Hanbury.

Caulis 30-50(-70) cm., robustus, foliis caesiis praeditus. *Involucra* prope basin obscure floccosa, nonnunquam pilis paucis solitariis obsita. Aliter ut in typo.

Stem 30-50(-70) cm. high, robust, with caesious-green leaves. *Heads* obscurely floccose about the base, sometimes with a few solitary pilose hairs. Otherwise like the type.

This plant, which has been repeatedly collected in Teesdale by Backhouse, Baker and others as *H. gothicum*, is very distinct in its slender habit, little toothed foliage, and few heads with dark, narrowly triangular-lanceolate and almost naked phyllaries. Elfstrand, commenting on specimens from the Lake District, thought it a separate species. The variety *robustum* has a distinct aspect owing to its robust habit, but in essential features it agrees with the typical form except for its less completely glabrous phyllaries. The species is widely spread in the North of England, and both type and variety are uniform in their different stations. There is a peculiar plant in Herb. Mus. Brit. and Herb. Hanbury, collected by Ley in 1887 in the Llanwrtyd valley, in Brecon, which seems to be a form of *H. calviceps* with numerous, relatively small heads. Other specimens there, from Berriedale and Yarehouse, in Caithness, resemble *H. calviceps*, but have much narrower and more cylindrical heads. Further material of this form is desirable. *H. calviceps*, together with the two following species, appears to be included in Backhouse's account of *H. gothicum* Fr.

Distribution.—64. M.W. Yorks : Settle (R. F. Thompson). 65. N.W. Yorks : Winch Bridge, Teesdale! 66. Durham : Forest-in-Teesdale (Lousley). 69. Westmorland : Langdale (Ley). Codall Tarn and Grasmere (Fox). 70. Cumberland : Ennerdale (Fox). 86. Stirling : Denny (Kidston).

var. *robustum*.

64. M.W. Yorks : Colwith (Fox). Ingleboro' (Cotton). Settle (Painter). Stainforth Force (Hanbury). Ingleton (Ley). 65. N.W. Yorks : Sedbergh (Wilson). 69. Westmorland : Middle Tongue (E. G. Baker). Dungeon Gill (W. R. Linton). 75. Ayr : Ballantrae (Somerville).

Endemic.

194. *HIERACIUM GOTHICOIDES* sp. nov.

H. gothicum var. *basifolium* Hanb. in Bab. Man. ed. 9, 261 (1904) ?

Icon.—Pl. 11, fig. a.

Exsicc.—Backhouse, Clova, 1852 (type), as *H. gothicum*, in Hb. Backhouse ; Pugsley, Braemar, 1923, in Hb. Pugsley ; Linton, Clova, 1889 ; Marshall no. 2867 ; Linton no. 96 (Irverey), as *H. gothicum* ; all in Hb. Hanbury ; Marshall nos. 2867 and 4300, in Hb. Mus. Brit.

Planta pseudophyllopodia. *Caulis* 30–80 cm., erectus, omnino glaber aut praesertim basin versus pilosus. *Folia* dilute vel pallide viridia, infima saepe magna, reliqua mox sursum minora ; basalia obovato-lanceolata ad lanceolata, subacuta ad acuta, dentibus parvis argutis irregulariter serrato-dentata, inferne in petiolum alatum ± brevem attenuata ; *caulina* 5–16, lanceolata, acuminata, argute serrata ad serrulata, basi ± attenuata sessilia, summa linearia, bracteaeformia ; omnia glabrescentia vel inferne (raro in paginis ambabus) parce pilosa vel floccosa, marginibus ± ciliatis. *Anthela* racemoso- (rarius paniculato-) corymbosa, 2–10(–25)-cephala, normaliter ramis gracilibus suberectis acladium breve superantibus compacta, pedunculis ± floccosis, nonnunquam etiam leviter pilosis. *Involucra* majuscula, latiuscula, basi subtruncata. *Squamae* numerosae, atrovirides, lineari-lanceolatae, obtusae ad acutae, vix floccosae, pilis basi obscuris numerosis, eglandulosae. Ligulae apice glabrae. *Styli* lutei. Receptaculi alveoli margine subulato-dentati.

Pseudophyllopodous. *Stem* 30–80 cm. high, erect, glabrous throughout or ± pilose, chiefly towards the base. *Leaves* light or pale green, the lowest often large, rapidly becoming small up the stem ; the basal obovate-lanceolate to lanceolate, subacute to acute, irregularly serrate-dentate with fine, sharp teeth, attenuate below to winged, ± short petioles ; *caulina* 5–16, lanceolate, acuminate, sharply serrate to serrulate, sessile with ± attenuate base, the uppermost becoming linear and bractlike ; all glabrescent or sparingly pilose or floccose beneath, rarely on both surfaces, margins

±ciliate. *Inflorescence* racemose- (rarely paniculate-)-corymbose, 2-10(-25)-headed, normally compact, with slender, suberect branches exceeding the short accladium, peduncles ±floccose, sometimes also slightly pilose. *Heads* rather large and broad, subtruncate-based. *Phyllaries* incumbent in bud, numerous, blackish green, linear-lanceolate, obtuse to acute, scarcely floccose, with ±numerous dark-based pilose hairs, eglandular. *Ligules* glabrous-tipped. *Styles* yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3.5 mm. long.

The *H. gothicum* of Backhouse's herbarium is mainly this species, his specimens being collected at Clova and Braemar. It differs essentially from the foregoing species of this Series by the normally pilose and eglandular indumentum of its phyllaries, and so does not accord with Fries's original description of *H. gothicum*. It seems to be widely spread in the Scottish Highlands.

H. gothiciforme (Dahlst.) is given for 'Forfar!' by Zahn, but no British specimens have been seen. It seems to be allied to *H. gothicoides*.

There are plants in Herb. Hanbury from Langwell Water and Thurso, in Caithness, that should possibly be referred to *H. gothicoides*.

A curious history attaches to *H. longiciliatum* (Hanb.). The plant was collected by Hanbury in 1887 by the Clunie at Braemar, and is represented by a single wild specimen in his herbarium. It was grown in his garden at Clapton but did not flower, and the herbarium cover contains three sheets of flowerless cultivated material. In Journ. Bot. xxx. 369 (1892) Hanbury described the plant as *H. Friesii* Hartm. var. *hirsutum*, suggesting that it might be a hybrid. Two years later he re-described it (l. c. xxxii. 231) as *H. rigidum* var. *longiciliatum* without reference to the earlier account; he remarked here that Linton had collected it in 1889 in the same locality. Ley in 1900 gathered what he thought to be the same plant at Glyn Collwng, in Brecon, and Brecon examples were distributed as *H. rigidum* var. *longiciliatum* in Linton's set of exsiccata no. 153. The Brecon plant was distinguished by Ley in 1901 as a new variety *strigosum*, and the naming of the no. 153 was corrected by Linton accordingly. Zahn saw an uncorrected sheet of Linton no. 153 and described from it in his Monograph his subspecies *longiciliatum* (Hanb.), continuing this with a description of another subspecies *substrigosum* (*H. rigidum* var. *strigosum* Ley) adapted from W. R. Linton's handbook! Hanbury's original specimen seems an abnormal form of *H. gothicoides*, with the stem and foliage suffused with purple and the phyllaries clothed with numerous dark glandular hairs similar to those of some forms of *H. Backhouseanum*. Linton's plant which Hanbury thought identical appears to be a form of the group *Foliosa* with seventeen stem-leaves and pilose phyllaries. It was originally named '*H. auratum* Fr.' by W. R. Linton. Later specimens from Braemar, collected by Shoolbred and others and referred to var. *longiciliatum*, are usually forms of *H. gothicoides*.

Distribution.—74. Wigton: Luce (McAndrew). 86. Stirling: Linn of Campsie (Buchanan-White). 89. E. Perth: Glen Shee (Linton). 90. Forfar: Clova (Backhouse). 92. S. Aberdeen: Braemar! Crathie (Shoolbred). Inverey (Linton). 96. E. Inverness: Kingussie (W. F. Miller). Bridge of Brown (Marshall). Kineraig (Somerville).

Endemic.

195. *HIERACIUM UIGINSKYENSE* sp. nov.

Exsicc.—W. R. Linton, Uig, 1888 (type), as *H. gothicum*; Shoolbred, Glen Clunie, 1906; both in Hb. Hanbury; Groves, Aviemore, 1899, in Hb. Pugsley; Marshall no. 3871 and Linton no. 69 (Uig), in Hb. Mus. Brit.

Planta hypophyllopoda vel aphylllopoda. *Caulis* 20-40 cm., flexuosus, gracilis, praesertim basin versus longe pilosus, interdum superne glabrescens. *Folia* 5-12,

pallide vel luteo-viridia, *mox sursum minora* ; radicalia, si adsint, ovalia ad oblonga, rotundato-obtusum-mucronulata, subintegra ad remote denticulata, inferne in petiolum brevem attenuata ; caulina inferiora *elliptico-lanceolata*, acuta, tenuiter et parce dentata vel *denticulata*, in petiolum \pm brevem contracta, superiora minora, acuminata, saepe subintegra, sessilia ; omnia superne *parce pilosa* vel glabrescentia, inferne parce pilosa et (saltem superiora) floccosa ; marginibus ciliatis. *Anthela racemoso-corymbosa*, 2-5(-10)-*cephala*, ramis suberectis *compacta* ; pedunculi floccosi, nonnunquam pilis paucis patulis obsiti. *Involucra majuscula, latiuscula*, basi truncata. *Squamae atrovirides, latae*, lineari-lanceolatae, *obtusissimae*, basin versus parce floccosae, senescentes, *pilis densis pallidis tenuibus vel minutis microglandulisque numerosis vestitae*. Ligulae apice glabrae. *Styli lutei*. *Receptaculi alveoli margine dentato-fimbriati*.

Hypophyllopodous or *aphyllopodous*. Stem 20-40 cm. high, flexuous, slender, long-pilose, especially towards the base, sometimes glabrescent above. Leaves 5-12, pale or yellowish green, *quickly becoming small upwards* ; the radical, when produced, oval to oblong, rounded-obtusum-mucronulate, subentire to remotely denticulate, attenuate below to short petioles ; lower cauline *elliptic-lanceolate*, acute, finely and sparsely dentate or *denticulate*, contracted below to \pm short petioles, the upper smaller, acuminate, often subentire, sessile ; all *sparingly pilose* or glabrescent above, sparingly pilose and (at least the upper) floccose beneath ; margins \pm ciliate. *Inflorescence compactly racemose-corymbose*, 2-5(-10)-headed, with suberect branches ; peduncles floccose, with sometimes a few spreading pilose hairs. Heads rather large and broad, truncate-based. *Phyllaries* incumbent in bud, numerous, blackish-green, broad, linear-lanceolate, *very obtuse*, sparingly floccose towards the base and sometimes along the margins, *with dense, fine or minute, pale pilose hairs mixed with microglands*. Ligules glabrous-tipped. *Styles yellow*. *Margins of receptacle-pits dentate-fimbriate*. Achenes blackish brown, about 3 mm. long.

H. uiginskyense somewhat resembles *H. calviceps* in habit and foliage, but differs in the peculiar pilose and microglandular clothing of its involucre. It was collected in some quantity by W. R. Linton at Uig, in Skye (hence the name !), and is well represented in Herb. Hanbury. Henry Groves also obtained good specimens at Aviemore, which were presented to me, unnamed, by his brother James. A form found at Glenarm, County Antrim, by Dr. Praeger in 1937 seems likewise to belong here.

This plant was sent out by Linton in his set no. 69 (as *H. gothicum*), but the sheets are not homogeneous, for that in Herb. Hanbury shows weak examples of *H. gothicoides* from Clova, which bear a superficial resemblance to *H. uiginskyense*. Zahn cites Linton no. 69 from Skye under his *H. laevigatum* subsp. *subgracilipes*, but his description indicates a plant widely different from *H. uiginskyense*, with glandular, epilose heads, which cannot be identified as British. The sheet of Linton no. 69 in Herb. Mus. Brit. has specimens from Uig, and these are *H. uiginskyense*. Shoolbred's specimens in Herb. Hanbury from Glen Clunie are labelled '*H. sparsifolium* var. *longiciliatum* Hanb.'

Distribution.—88. Mid Perth : Fortingal (Marshall). 92. S. Aberdeen : Braemar (Hb. Backhouse). Glen Clunie (Shoolbred). 96. E. Inverness : Aviemore (Groves). 104. N. Ebludes : Uig, Skye (W. R. Linton).

Ireland.—39. Antrim : Glenarm (Praeger).

Endemic.

196. *HIERACIUM TRINITATIS* sp. nov.

Exsicc.—Riddelsdell, Cwm Haffes, 1902 (type), in Hb. Mus. Brit.

Planta pseudophyllopoda. Caulis 40-60 cm., erectus, ad basin longe pilosus,.

superne sparsim pilosus floccosusque. *Folia* 10–20, crassiuscula, pallide griseo-viridia, infra glaucescentia; basalia lanceolata ad oblongo-lanceolata, acuta, remote denticulata ad irregulariter serrata, basi in petiolum brevissimum, alatum, villosum attenuata; caulina (*sursum cito minora*) lanceolata, acuminata, *dentibus paucis remotis argutis* (saepe angustis) *arrectis* munita, basi breviter cuneatâ sessilia; summa lineari-lanceolata, longe acuminata, basin sessilem versus dentibus paucis tenuibus; omnia *utrinque*, praesertim in paginâ inferiore, *floccosa*, basalia inferne plurimum in costâ dorsali etiam pilosa; *marginibus dense scaberulis* hinc inde ciliatis. *Anthela paniculato-corymbosa*, 3–15-*cephala*, ramis erecto-patulis, nonnullis in plantis validis e foliorum superiorum axillis emissis; pedunculi floccosi interdum pilis solitariis immixtis. *Involucra majuscula*, basi rotundata. *Squamae obscure olivaceae*, numerosae (exteriores laxiusculae), lineari-lanceolatae, *obtusae ad subacutae, efloccosae, pilis densis pallidis tenuibus minutisque microglandulis immixtis* vestitae. Ligulae apice glabrae. *Styli lutei*.

Pseudophyllopodous. *Stem* 40–60 cm. high, erect, long-pilose about the base, sparingly pilose and floccose above. *Leaves* 10–20, rather thick, pale greyish green, glaucescent beneath; the basal lanceolate or oblong-lanceolate, acute, distantly denticulate to irregularly and remotely serrate, attenuate below to very short, winged, villous petioles; the cauline (*rapidly decreasing upwards*) lanceolate, acuminate, with a few distant, sharp, often narrow, ascending teeth, sessile with a \pm shortly cuneate base; the uppermost linear-lanceolate, long-acuminate, with a few fine teeth towards the sessile base; all *floccose on both surfaces*, especially beneath, the lower also pilose beneath, chiefly along the midrib; *margins densely scaberulous*, intermittently ciliate. *Inflorescence paniculate-corymbose*, 3–15-headed, with erect-spreading branches, some from the upper leaf-axils in strong plants, peduncles floccose with occasional solitary pilose hairs. *Heads rather large*, rounded below. *Phyllaries* incumbent in bud, *dark olive-green*, numerous (the outer rather lax), linear-lanceolate, *obtuse to subacute, efloccose, with dense fine pale and minute pilose hairs mixed with microglands*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits (not seen). Achenes blackish brown, about 3 mm. long.

H. trinitatis seems intermediate in general features between *H. gothicoides* and *H. uiginskyense*. In habit and foliage it recalls the former, except for the pale colour and floccose indumentum of the leaves. The clothing of its phyllaries resembles that of *H. uiginskyense*, but they are narrower, less obtuse, and lighter in colour. The scaberulous leaf-margins may indicate a relationship with the *Eu-Tridentata*. A good set of specimens was obtained in Cwm Haffes, Cellwen, by Riddelsdell in 1902, which was set aside with a note 'Awaits determination. Only to be distributed to hawkweed students', initialled by Hanbury and the two brothers Linton. Hence the name now proposed!

Distribution.—42. Brecon: Cellwen (Riddelsdell).

Endemic.

Series **Backhouseana**. (See page 234.)

197. *HIERACIUM BACKHOUSEANUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925). *H. gothicum* var. *latifolium* Hanb. in Bab. Man. ed. 9, 261 (1904); *H. gothicum* f. *latifolia* W. R. Lint. Brit. Hier. 77 (1905), partim; *H. laevigatum* subsp. *Backhouseanum* Zahn, l. c. 881 (1922).

Exsicc.—Linton no. 70 (Inverey), as *H. gothicum* var. *latifolium*, in Hb. Mus. Brit. and Hb. Hanbury.

Pseudophyllopodous. *Stem* 40–50 cm. high, robust, pilose about the base, obscurely so above. *Leaves* dull or caesious green, *rapidly becoming smaller upwards*; the

basal oblong, obtuse to subacute, subentire to remotely denticulate, attenuate below to short, winged petioles; *cauline* 6-10(-20), the lower *elliptic-lanceolate*, acute, \pm remotely *denticulate*, attenuate below, subsessile, the upper *elliptic-lanceolate* to lanceolate, acuminate, denticulate, sessile with \pm rounded base; all *sparingly pilose* (chiefly on the midrib beneath) or glabrescent on the upper surface, with ciliate margins. *Inflorescence paniculate-corymbose*, 6-12-headed, with rather long, erect-spreading branches; peduncles floccose. *Heads large and broad*, truncate-based. *Phyllaries* incumbent in bud, numerous, dark olive or blackish green, the inner with paler margins, broad, linear-lanceolate, obtuse, sparingly floccose towards the base, with numerous dark-based pilose and shorter or finer glandular hairs. Ligules glabrous-tipped. *Styles normally yellow*. *Margins of receptacle-pits dentate-fimbriate*. Achenes blackish brown, about 3 mm. long.

β . radnoricum var. nov.

Exsicc.—Hanbury, Pont-ar-Elan, 1899 (type), in Hb. Hanbury.

Caulis inferne rubescens. Folia inferiora obscure denticulata, superiora basin versus dentibus paucis parvis argutis praedita. Pedunculi leviter pilosi. Squamae obscure olivaceae, quam typi densius glandulosae. Styli lividi.

Stem reddish towards the base. Lower leaves obscurely denticulate, upper with a few fine, sharp teeth towards the base. Peduncles slightly pilose. Phyllaries dark olive-green, more densely glandular. Styles livid. Otherwise as in the type.

γ . latifolium comb. nov.

H. gothicum var. *latifolium* Backh. Mon. 65 (1856).

Exsicc.—Backhouse, Clova, 1852 (type), as *H. gothicum* var. *latifolium*, in Hb. Backhouse; Hanbury, Melvich, 1887 and 1915, in Hb. Hanbury; Linton no. 70 (Melvich), as *H. gothicum* var. *latifolium*; Marshall no. 4099; both in Hb. Mus. Brit.

Stem reddish below. Lower leaves usually elliptic, sometimes remotely serrate; upper sometimes lanceolate or linear, with a few teeth or subentire. Peduncles sometimes slightly pilose. Phyllaries blackish green, a little floccose and senescent, pilose and glandular hairs few. Styles yellow. Otherwise like the type.

H. Backhouseanum, though somewhat variable in different habitats, is a well-marked and handsome plant that is widely spread over Britain. Zahn curiously cites for it two of Linton's sets of exsiccatae, viz.: no. 70, issued as *H. gothicum* var. *latifolium*, and no. 96, as *H. gothicum*; and marks the latter with a note of exclamation. The plants seen of both sets were obtained in part at Inverey, near Braemar, and are quite distinct, the latter being clearly *H. gothicoides*. It is not known whether Zahn saw *H. gothicoides* as no. 96, or whether, as in the case of no. 70, specimens obtained from different localities were used which might have included *H. Backhouseanum*. Zahn's description does not clearly characterize either species, and his localities are evidently taken from W. R. Linton's work, but as he cites *H. gothicum* f. *latifolium* W. R. Lint. as a synonym and quotes Linton no. 70, it may be assumed that this broad-leaved plant is what he intended to distinguish as *H. Backhouseanum*.

A form resembling var. *radnoricum* but with narrower, lanceolate leaves, and still more glandular heads was distributed by T. A. Cotton in 1892 from Keld, in Swaledale, Yorkshire. Another, collected by Ley at Abergwesyn, in Brecon, in 1897, may be a slender form of typical *H. Backhouseanum*.

There is a very fine specimen in Herb. Hanbury, collected in 1893 by Hart above Martin's Bridge, near Glenties, Co. Donegal, that resembles *H. Backhouseanum*. It is a luxuriant plant fully 100 cm. in height, with fistular, glabrescent stem, and broad, nearly glabrous foliage resembling in form that of this species. The flower-heads are in a large panicle, and the dark phyllaries have a dorsal line of dark glandular hairs. The specimen was labelled '*H. rigidum* var. *acrifolium* Dahlst.' It is evident that the hawkweeds of Donegal would repay further research.

Distribution.—87. W. Perth : Glen Devon (Syme). 88. Mid Perth : Lawers ! Fortingal (Marshall). 92. S. Aberdeen : Inverey (Linton). 96. E. Inverness : Laggan (Marshall).

Ireland.—16. W. Galway : Ben-na-Bola (Backhouse).

var. *radnoricum*.

43. Radnor : Pont-ar-Elan (Hanbury).

var. *latifolium*.

90. Forfar : Clova (Backhouse). 108. W. Sutherland : Melvich (Hanbury). 109. Caithness : Watton (Hanbury).

Endemic.

198. *HIERACIUM PSEUDACRIFOLIUM* sp. nov.

Exsicc.—Ley, Trawsnant, 1897 (type), as *H. rigidum* var. —, in Hb. Hanbury ; Ley, Glyn Collwng, in Hb. Mus. Brit.

Planta aphyllopoda vel hypophyllopoda. *Caulis* 40–70 cm., *robustus*, pilis patentibus praesertim basin versus hirsutus, tandem superne saepius scaberulus vel glabrescens, nonnunquam etiam floccosus. *Folia* 8–15, obscure viridia ; inferiora *elliptico-lanceolata ad elliptico-oblonga*, acuta, medio *dentibus paucis argutis porrectis munita* (rarius denticulata), basi cuneata, sessilia vel infima breviter alato-petiolata, media superioraque similia, sensim basi brevius cuneata et minora, summa fere integra vel bractaeaeformia ; omnia utrinque *pilis basi bulbosis hirsuta* vel superiora superne glabrescentia, in paginâ inferiore ± floccosa ; marginibus ciliatis tandem scaberulis. *Anthela racemoso-corymbosa*, 3–8(–16)-*cephala*, interdum e foliorum axillis ramos ± breves emittens ; pedunculi floccosi, pilis solitariis numerosisve obsiti. *Involucra majuscula*, inferne rotundata. *Squamae atrovirides, satis latae*, lineari-lanceolatae, obtusae, *efloccosae, glandulis obscuris longis brevibusque ± numerosis et pilis solitariis vestitae*. Ligulae apice glabrae. *Styli lutescentes*. Alveoli receptaculi margine dentati.

Aphyllopodous or hypophyllopodous. *Stem* 40–70 cm. *high, robust*, pilose with spreading hairs, densely so below, becoming scaberulous or glabrescent and sometimes floccose upwards. *Leaves* 8–15, dull green ; lower *elliptic-lanceolate to elliptic-oblong*, acute, *with a few sharp, ascending teeth* (more rarely denticulate) *about the middle*, cuneate-based, sessile or the lowest shortly petioled ; median and upper similar, but becoming more shortly cuneate-based and smaller ; uppermost nearly entire or bractlike ; all *pilose with bulbous-based hairs* on both surfaces or the upper glabrescent above, the lower surface ± floccose ; margins ciliate, becoming scaberulous. *Inflorescence racemose-corymbose, 3–8(–16)-headed*, sometimes with short or longer lower branches from the leaf-axils ; peduncles floccose, with solitary or numerous pilose hairs. *Heads rather large, rounded below*. *Phyllaries incumbent in bud, blackish green, rather broad, linear-lanceolate, obtuse, efloccose, with ± numerous long and short, dark glandular and some solitary pilose hairs*. Ligules glabrous-tipped. *Styles yellowish*. Margins of receptacle-pits dentate. Achenes blackish brown, about 3 mm. long.

This hawkweed, originally collected by Ley in 1897 near Trawsnant Farm, in the Upper Towy Valley, Breconshire, and subsequently in the Upper Tawe Valley and Glyn Collwng, was at first referred to *H. rigidum* var. *pullatum* and later to *H. tridentatum* var. *acrifolium* Dahlst. From both of these plants it may readily be separated by its robust growth, relatively broad leaves and large heads. It appears to be allied to *H. Backhouseanum* (Zahn), but shows little tendency to pseudophyllopody, and the subracemose panicle of its heads is characteristic. A form resembling this plant, but with more pilose inflorescence and eglandular, densely pilose phyllaries, was found by Ley in 1894 near Aberdare, Glamorgan.

Distribution.—42. Brecon : Upper Towy and Tawe Valleys, and Glyn Collwng (Ley). 48. Merioneth : Bala (Ley).

Endemic.

199. *HIERACIUM SCULLYI* W. R. Linton, Brit. Hier. 72 (1905).

H. carpathicum subsp. *Scullyi* Zahn, l. c. 812 (1921).

Icon.—Pl. 11, fig. b.

Exsicc.—Scully, Roughty River, Kerry, 1901, 1903 and 1904 ; Marshall no. 2732 ; all in Hb. Mus. Brit.

Pseudophyllopodous. Stem 30–60 cm. high, robust, densely pilose with \pm bulbous-based hairs about the base, glabrescent above. Leaves deep green, strongly veined ; the basal oval, rounded-obtuse, subentire, \pm abruptly narrowed to short, winged, pilose petioles ; cauline 6–15(–30, cult.), \pm broadly elliptic, acute, with a few distant teeth or denticulations on each side, the lower shortly attenuate below, the upper sessile with rounded base ; all pilose (with spreading hairs beneath) or the upper glabrescent, margins ciliate. Inflorescence paniculate-corymbose, 2–12(–20, cult.)-headed, with erect-spreading branches exceeding the short accladium, sometimes also with long lower branches from the leaf-axils ; branches and apically thickened peduncles floccose with occasional pilose hairs. Heads rather large, broad, truncate-based. Phyllaries incumbent in bud, blackish green, the inner with paler margins, numerous, rather broad, linear-lanceolate, mostly obtuse, \pm floccose towards the base, with numerous microglands and fewer longer glandular hairs, generally sparsely pilose. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits subulate-dentate, sometimes shortly sub-fimbriate. Achenes blackish brown, about 3.5 mm. long.

This plant was published by W. R. Linton as a new species of the group *Alpestrina*, but its position there seems scarcely justified and Linton himself was at first 'disposed to put it in the *Rigida* somewhere near *cantianum*'. Although its cauline leaves are sessile and remarkably broad, yet they are distinctly not semi-amplexicaul, and in form, as well as venation, they recall species of the *Foliosa*. The pseudophyllopodous habit, however, excludes it from that group. On the whole, the plant seems most closely allied to *H. gothicum* sensu lato of the Section *Tridentata*, of which some forms resemble it in foliage as well as in inflorescence and the involucre. In cultivation it grows no taller than in the wild state, but the stems become extremely leafy, and the inflorescence more floriferous with smaller, paler heads. Linton's account was based on specimens collected in 1901 by R. W. Scully on rocks by the Roughty river, in Kerry.

Distribution.

Ireland.—1. S. Kerry : Roughty River (Scully) !

Endemic.

200. *HIERACIUM ARDARICUM* sp. nov.

Icon.—Pl. 16, fig. b.

Exsicc.—Hart, Ardara, 1893 (type), in Hb. Hanbury and in Hb. Dublin ; Hart, Ray River, 1894, in Hb. Mus. Brit.

Planta pseudophyllopoda. Caulis 25–60 cm., gracilescens, inferne dense pilosus, sursum glabrescens leviter floccosus. Folia 12–15, crassiuscula, saturate viridia, a. caulis basi sursum minora, inferiora \pm aggregata ; basalia ovato-elliptica ad elliptica, obtuso-mucronulata ad subacuta, subintegra ad obscure denticulata, in petiolum brevem alatum angustata ; caulina elliptica, acuta ad acuminata, remote denticulata.

(raro leviter dentata), basi cuneatâ \pm sessilia; summa ovato-lanceolata, tenuiter acuminata, subintegra, sessilia; omnia *superne glabra* vel basalia nonnunquam parce pilosa, inferne praesertim in costâ dorsali pilosa, marginibus ciliatis mox scaberulis. *Anthela racemoso-corymbosa*, 1-6(-10)-*cephala*, ramis gracilibus suberectis, pedunculis floccosis. *Involucra mediocria ad majuscula*, inferne rotundata. *Squamae saturate olivaceae*, exteriores \pm laxae vel apice recurvatae, lineari-oblongae, obtusae, inferne sparsim floccosae, leviter senescentes, *pilis tenuibus pallidis densis microglandulisque (glandulis obscuris paucis immixtis) vestitae*. Ligulae apice glabrae. *Styli sordide lutei*. *Alveoli receptaculi margine dentibus in setas inaequales longas (usque ad 3 mm.) productis subulato-dentati*.

Pseudophyllopodous. Stem 25-60 cm. high, rather slender, densely pilose below, becoming glabrescent and slightly floccose upwards. Leaves 12-15, rather thick, deep green, diminishing from the base of the stem upwards, the lower \pm aggregate; basal ovate-elliptic to elliptic, obtuse-mucronulate to subacute, subentire to obscurely denticulate, narrowed below to short, winged petioles; cauline elliptic, acute to acuminate, remotely denticulate (rarely slightly dentate), \pm sessile with cuneate base; uppermost ovate-lanceolate, finely acuminate, subentire, sessile; all glabrous above, or the basal sometimes slightly pilose, and pilose, especially on the midrib, beneath; margins ciliate, readily becoming scaberulous. Inflorescence racemose-corymbose, 1-6(-10)-headed, with slender, suberect branches; peduncles floccose. Heads of medium size to rather large, rounded below. Phyllaries incumbent in bud, dark olive-green, the outer \pm lax or with reflexed tips, linear-oblong, obtuse, sparingly floccose below and slightly senescent, with dense fine, pale pilose hairs and microglands, and a few dark glandular hairs intermixed. Ligules glabrous-tipped. Styles dull yellow. Margins of receptacle-pits subulate-dentate, with unequal, long, setaceous points (up to 3 mm.). Achenes blackish brown, about 3 mm. long.

This species was discovered in 1893 on the Owenroe river, above Ivy Bridge, Ardara, Co. Donegal, by H. C. Hart, who described it as a 'charming, neat plant'. In the following year Hart collected it again by the Ray river, Falcarragh, in the same county, and on cliffs at an altitude of 1,800 feet on Croaghgorm. Earlier specimens were obtained in 1891 by Hanbury by the river Eglis, also in Donegal.

H. ardaricum resembles *H. Scullyi*, but differs in its slenderer habit, with narrower, more elliptic leaves, a more compact panicle with somewhat narrower heads and phyllaries, and especially by the remarkably long setaceous marginal points to its alveoles.

Distribution.

Ireland.—35. W. Donegal: Owenroe and Ray Rivers, and Croaghgorm (Hart). Eglis River (Hanbury).

Endemic.

201. *HIERACIUM STEWARTII* (F. J. Hanbury) Roffey in Lond. Cat. ed. 11 (1925).

H. Friesii var. *Stewartii* Hanb. in Journ. Bot. xxx. 369 (1892); *H. gothicum* var. *Stewartii* Hanb. in Bab. Man. ed. 9, 261 (1904); *H. rigidum* var. *Stewartii* W. R. Lint. Brit. Hier. 83 (1905); *H. laevigatum* subsp. *Stewartii* Zahn, l. c. 863 (1921).

Exsicc.—Praeger, Mourn Mts., 1899; Stewart and Praeger, Hilltown, 1890; Hanbury, eodem loco, 1891; Linton no. 152; all in Hb. Hanbury; Stewart, Hilltown, 1891, in Hb. Dublin.

Hypophyllopodous or *aphyllopodous*. Stem 30-100 cm. high, robust, reddish, at least towards the base, loosely pilose below, nearly glabrous above. Leaves (cauline 12-20) large, becoming smaller upwards, deep green, usually conspicuously veined; the basal oval to oval-lanceolate, rounded-obtuse-mucronulate to subacute, subentire to distantly denticulate and with 2-3 \pm large, curved, acuminate teeth on each side.

narrowed below to short, winged petioles ; median *elliptic-lanceolate* to lanceolate, *acuminate to cuspidate*, with a few very unequal, long, acuminate teeth (often curved upwards), sessile with cuneate base ; uppermost lanceolate to linear-lanceolate, with 1-2 long teeth or entire, sessile ; all nearly glabrous, the lower sparsely pilose and the uppermost sometimes floccose beneath, margins sparingly ciliate. Inflorescence racemose- to paniculate-corymbose, 3-12(-20)-headed, generally with long, slender, suberect branches exceeding the accladium ; peduncles floccose. Heads large to very large, broad, truncate-based. *Phyllaries* incumbent in bud, dark olive-green, numerous, the outer lax, linear-lanceolate, obtuse, loosely floccose about the base and the margins of the outer scales, with \pm numerous, fine, dark glandular and occasionally some solitary pilose hairs. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits subulate-dentate. Achenes blackish, about 4 mm. long.

β. Praegeri var. nov.

Icon.—Pl. 17.

Exsicc.—Stewart and Praeger, Tollymore Park, 1890 (type) ; Hart, eodem loco, 1883 ; both in Hb. Dublin ; Hanbury, Tollymore Park, 1891, in Hb. Hanbury.

Folia media latiora, rhomboidalia, subacuta, dentibus magis aequalibus multo brevioribus, patentibus potiusquam sursum curvatis praedita. Involucra paulo minora.

Median leaves broader, rhomboidal, subacute, with more regular and much shorter teeth, which are spreading rather than curved upwards. Heads rather smaller. Otherwise like the type.

H. Stewartii, in its typical form, is a distinct and handsome plant, conspicuous by its fine foliage with long, cusped teeth, and for its large flower-heads. It was first collected (as var. *Praegeri*) by Hart, whose specimens in the Dublin Museum have been overlooked.

Distribution.

Ireland.—38. Down : Hilltown (Stewart and Praeger).

var. *Praegeri*.

38. Down : Tollymore Park (Hart).

Endemic.

Series **Sparsifolia**. (See page 235.)

202. *HIERACIUM SUBINTEGRIFOLIUM* sp. nov.

Exsicc.—Pugsley no. 813 (type), in Hb. Pugsley.

Planta aphyllopoda. Caulis 40-50 cm., satis gracilis, basin versus rubescens, longe pilosus vel scaberulus, superne tandem glabrescens. Folia 8-10, longa, angusta, saturate viridia, inferne pallidiora, conspicue nervata ; inferiora lanceolata ad lineari-lanceolata, longe acuminata, subintegra vel remote sinuato-denticulata, inferne longe attenuata in petiolum brevem vel sessilia ; superiora anguste ovato-lanceolata, longe et tenuiter acuminata, integra vel denticulis paucis munita ; omnia utrinque pilis brevibus basi bulbosis dense hirsuta vel superiora in paginâ superiore glabrescentia ; marginibus breviter ciliatis vel scaberulis. Anthela paniculato-corymbosa, 3-12-cephala, ramis \pm longis patulis accladium superantibus ; pedunculi flocculosi, pilis obscuris solitariis sparsis obsiti. Involucra majuscula, latiuscula, basi rotundata. Squamae atrovirides, exteriores apice squarrosae, latae, lineari-lanceolatae, obtusae, effloccosae, pilis multis basi obscuris glandulis paucis brevibus obscuris microglandulisque numerosis vestitae. Ligulae apice glabrae. Styli lividi. Alveoli receptaculi margine inciso-dentati.

Aphyllopodous. Stem 40-50 cm. high, rather slender, reddish below, long-pilose.

or scaberulous, becoming glabrescent above. *Leaves* 8–10, long and narrow, dark green, paler beneath, with conspicuous venation; the lower lanceolate or linear-lanceolate, long-acuminate, *subentire* or remotely sinuate-denticulate, long-attenuate below to short petioles or sessile; upper narrowly ovate-lanceolate, long and finely acuminate, entire or with a few denticulations; all *densely pilose* on both surfaces with short bulbous-based hairs or the upper \pm glabrescent above, margins shortly ciliate or scaberulous. *Inflorescence* *paniculate-corymbose*, 3–12-headed, with \pm long, *spreading branches* exceeding the aeladium; peduncles flocculose, with scattered, solitary, dark pilose hairs. *Heads* rather large and broad, rounded below. *Phyllaries* incumbent in bud, *blackish green*, the outer with spreading tips, broad, linear-lanceolate, obtuse, effloccose, with numerous dark-based pilose hairs, a few short, dark glandular hairs and many microglands. *Ligules* glabrous-tipped. *Styles* livid. Margins of receptacle-pits incise-dentate. Achenes blackish brown, about 3.5 mm. long.

This hawkweed is remarkable for its long, narrow, hirsute and very slightly toothed foliage, and its broad, spreading panicle of large, dark flower-heads. It does not seem very closely allied to any other British species. Its thickened, scaberulous leaf-margins, and the pilose development about the base of its leaves indicate that it belongs to the Section *Tridentata*, and its wide panicle of broad, pilose heads recalls such species as *H. substrigosum* (Zahn). It is perhaps most nearly related to *H. stictophyllum* Dahlst. and *H. placerophylloides* Pugsl. It was discovered in limited quantity in 1927 on grassy banks in Glenridding, near the south end of Ullswater. In 1934 I met with a somewhat similar plant in the Roughty valley, County Kerry, near the station for *H. Scullyi*, but it was too young for certain determination.

Distribution.—69. Westmorland: Glenridding!

Endemic.

203. *HIERACIUM STICTOPHYLLUM* Dahlstedt, Hier. Sc. iv. 81 (1893), nomen solum; Bot. Faeroes, 642 (1903); W. R. Lint. Brit. Hier. 77 (1905); *H. laevigatum* subsp. *phyllopodioides* var. *gothicum* f. *centonata* Williams, l. c. 167 (1902); *H. sparsifolium* Hanb. in Bab. Man. ed. 9, 262 (1904), non Lindeberg in Bot. Not. 79 (1868); *H. laevigatum* subsp. *stictophyllum* Zahn, l. c. 871 (1922).

Exsicc.—Dahlst. H. Sc. iv. 81, in Hb. Kew; Hanbury, Lake Laggan, 1916; Marshall no. 3743; both in Hb. Hanbury.

Pseudophyllopodous or *hypophyllopodous*, rarely *aphyllopodous*. *Stem* 20–60 cm. high, slender, generally purplish and pilose about the base, glabrescent above. *Leaves* 10–16, narrow, dull green, richly blotched on the upper side with purplish brown; the basal obovate to oblong, obtuse-mucronulate, subentire, attenuate below to slender, generally short petioles; lower and median lanceolate to linear-lanceolate, acute to acuminate, *subentire* to remotely serrulate or denticulate (or serrate, cult.), long-attenuate below to short petioles or sessile; upper smaller, linear-lanceolate, acuminate, usually subentire, sessile with shortly contracted or rounded base; all glabrescent above, generally sparingly pilose and occasionally floccose beneath; the margins \pm ciliate. *Inflorescence* *racemose- to paniculate-corymbose*, 2–10(–20)-headed, with long, slender, suberect or erect-spreading branches, peduncles apically thickened, \pm floccose, sometimes with a few pilose hairs. *Heads* of medium size to rather large, rounded below. *Phyllaries* incumbent in bud, olive or sometimes blackish green, the outer rather lax, \pm broad, linear-lanceolate, obtuse to subacute, scarcely floccose, sometimes senescent, with \pm numerous dark-based pilose hairs, mixed with short glandular hairs and microglands. *Ligules* glabrous-tipped. *Styles* yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, 3–3.5 mm. long.

β. serpentinum W. R. Linton, Brit. Hier. 77 (1905).

H. rigidum var. *serpentinum* Hanb. in Journ. Bot. xxxii. 231 (1894) ; *H. laevigatum* subsp. *stictophyllum* var. *serpentinum* Zahn, l. c. 871 (1922).

Exsicc.—Ley, Hatterels, 1886 ; Blaen Taf fawr, 1888 ; both in Hb. Hanbury ; Linton no. 97, in Hb. Mus. Brit.

Stem taller, -80 cm. high. Leaves rather broader and less acute than in the type, the lower with longer petioles, the median remotely sinuate-dentate with short, broad teeth. Heads rather large, truncate-based, with obtuse, blackish green phyllaries. Otherwise like the type.

γ. concolor var. nov.

Exsicc.—Linton, Fortingal, 1891 (type), as *H. sparsifolium* var. —, in Hb. Hanbury ; Linton no. 24, in Hb. Mus. Brit. and Hb. Hanbury.

Planta vulgo pseudophyllopoda. Folia ad 18, pallide viridia, haud maculata. Anthela ad 20-cephala ; squamae olivaceae.

Usually pseudophyllopodous. Leaves -18, pale green, unspotted. Panicle -20-headed ; phyllaries olive-green. Otherwise like the type.

H. stictophyllum was formerly identified with *H. sparsifolium* Lindbg., but it differs in several particulars. It is taller in growth normally, with a much more decompound panicle of flower-heads, which in strong plants are produced on long, erect-spreading branches. Its leaves are more attenuate at both ends, and normally heavily spotted ; and the number of its heads is on an average much greater. In the form and variegation of its foliage it resembles *H. pseudo-protractum* of the Section *Alpestris*. Stylose-flowered plants are occasionally found.

Distribution.—49. Carnarvon : Bethesda (Hanbury). Capel Curig (Marshall). 50. Denbigh : Conway Falls ! 67. Northumberland : Thorngrifton (J. Thompson). 69. Westmorland : High Cup Nick (Leach). 72. Dumfries : Moffat (Marshall). Sanquhar (Davidson). 73. Kirkeudbright : Carsphairn Hills (F. R. Coles). 77. Lanark : Symington (Druce). 88. Mid Perth : Ben Laoigh (Druce). 92. S. Aberdeen : Crathie (Marshall). 97. W. Inverness : Lake Laggan (Hanbury). Tomdown (Fisher). Fort William ! Glen Spean ! 98. Argyll : Loch Tulla (Hanbury). Dalmally (Marshall). Ben Cruachan (Groves). 102. S. Ebudes : Islay (Somerville). Jura (Ewing). 103. Mid Ebudes : Tobermory, Mull (Bailey). 104. N. Ebudes : Uig, Skye (W. R. Linton). 105. W. Ross : Broom (Druce). 106. E. Ross : Aultguish (Riddelsdell). Rogie Falls (Shoolbred). 107. E. Sutherland : Oykell Bridge (Hanbury). 108. W. Sutherland : Naver River (W. F. Miller). 110. Outer Hebrides : N. Harris (Duncan). S. Harris (Heslop Harrison). Stornoway (Rimington).

Ireland.—35. W. Donegal : Carrick River (Hanbury).

var. *serpentinum*.

36. Hereford : Hatterels (Ley). 41. Glamorgan : Craig-y-llyn (Hanbury). Aberdare (Riddelsdell). 42. Brecon : Blaen Taf and Nedd Glen (Ley). Gledisiau (Hanbury). 44. Carmarthen : Llyn-fan-fechan (Ley). 48. Merioneth : Cwm Bychan (W. R. Linton). 49. Carnarvon : Carnedd Dafydd (Hanbury). Llyn-an-Afon !

Ireland.—35. W. Donegal : Falcarragh (Hart). Killybegs (Hart).

var. *concolor*.

88. Mid Perth : Fortingal (Linton). Crianlarich (Marshall). 96. E. Inverness : Aviemore (Roffey). 97. W. Inverness : Glen Spean (Marshall and Shoolbred). 98. Argyll : Glen Etive (Bucknall).

General Distribution.—Norway.

204. *HIERACIUM SPARSIFOLIUM* Lindeberg, Hier. Sc. Exs. i. 48, and in Bot. Not. 79 (1868); W. R. Lint. Brit. Hier. 78 (1905); *H. laevigatum* subsp. *sparsifolium* Zahn, l. c. 872 (1922).

Exsicc.—Lindb. H. Sc. i. 48 and ii. 80; Dahlst. H. Exs. iii. 70, and H. Sc. xxi. 79; Fox, Ennerdale, 1888, in Hb. Hanbury.

Aphyllopodous. Stem 25–60 cm. high, slender, purplish about the base, slightly pilose (chiefly below) and \pm floccose. Leaves 10–15, pale or glaucescent green; the lowest oblong-spathulate, rounded-obtuse-mucronulate, subentire, attenuate below to \pm long, slender petioles, the median linear-oblong, acute, subentire or remotely denticulate, sessile with shortly contracted or rounded base, the upper small, lanceolate, sometimes with broad, semi-amplexicaul base; all glabrescent above, \pm pilose and floccose (especially the upper) beneath; margins obscurely ciliate. Inflorescence racemose-corymbose, 2–3(–7)-headed, with slender, suberect branches; peduncles floccose. Heads of medium size or rather large, subtruncate-based. Phyllaries incumbent in bud, blackish green, linear-lanceolate, obtuse, effloccose, with \pm numerous dark-based pilose and fewer, shorter, dark glandular hairs. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits . . . Achenes blackish brown, about 3 mm. long.

H. sparsifolium, which approaches *H. umbellatum* L. in its foliage rather than *H. tridentatum* Fr., appears to be a very rare plant in Britain, for the only specimens seen are two gathered by H. E. Fox in 1888 in a ghyll on Kirk Fell, Ennerdale, Cumberland, which were sent, unnamed, to Hanbury. These, though rather small plants, seem to be conspecific with Lindeberg's type, Hier. Sc. Exs. i. 48. W. R. Linton, in 'British Hieracia', records this species from Glen Spean, but the specimen on which this record is based (Marshall, below Tulloch, Glen Spean, 1896—now in Herb. Mus. Brit.) is *H. stictophyllum* var. *concolor*.

Distribution.—70. Cumberland: Ennerdale (Fox).

General Distribution.—Norway, Sweden.

205. *HIERACIUM OLIGODON* (Linton) Pugsley in Journ. Ecol. xxxiii. 346 (1946).

H. sparsifolium var. *oligodon* Lint. ex W. R. Lint. Brit. Hier. 78 (1905); *H. subintegrum* (Stenst.) Roffey in Lond. Cat. ed. 11 (1925); non *H. laevigatum* subsp. *subintegrum* Zahn, l. c. 876 (1922).

Exsicc.—Marshall nos. 2730 and 2731, in Hb. Mus. Brit.; Scully nos. 2532, 2533, 2534, 2766 and 2767, in Hb. Dublin.

Aphyllopodous or *hypophyllopodous.* Stem 20–50 cm. high, robust, purplish towards the base, pilose below, becoming floccose upwards. Leaves 6–12, deep or dull green, paler beneath; the basal oval to linear-oblong or lingulate, obtuse, subentire, narrowed below to \pm short, winged petioles; median lanceolate to lingulate, mostly subacute, subentire or remotely denticulate, sometimes with 1–2 large, blunt, spreading teeth in the lower half, sessile with shortly cuneate base; the upper smaller and narrower, subacute, generally subentire; all glabrous above, sparingly pilose, chiefly on the midrib, beneath, the upper sometimes also floccose there; margins very rarely ciliate. Inflorescence racemose-corymbose, 2–7(–10)-headed, with \pm long, suberect branches, peduncles apically thickened, bracteolate, floccose. Heads of medium size or rather large, broad, narrowed below. Phyllaries incumbent in bud, blackish green, broad, linear-lanceolate, mostly obtuse, sparsely floccose towards the base, with scattered, dark-based pilose and fine, short glandular hairs. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, 3–3.5 mm. long.

This plant was described from specimens collected by R. W. Scully and E. S. Marshall in 1903 on Poulgorm rocks and bridge, on the Clydagh river, in Kerry. It had, however, been previously found by Scully in this locality in 1899 and 1901, and also at Morley's bridge, on the Roughty river, in the latter year. There is also a specimen in Herb. Dublin, labelled '*H. sparsifolium*', from the Mourne Beg river in Co. Donegal. This specimen bears no date or collector's name, but it is likely to have been obtained by Hart, although the herbarium sheet is written up in a different handwriting.

H. oligodon is one of the most distinct hawkweeds of the Section, and clearly shows a relationship with *H. sparsifolium*, from which it differs in its robust habit and broader foliage.

Distribution.

Ireland.—1. S. Kerry : Clydagh and Roughty rivers (Scully). 34. E. Donegal : Mourne Beg river (Hart ?).

Endemic.

206. *HIERACIUM LINGUANS* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. sparsifolium var. *lingua* Ley ex W. R. Lint. Brit. Hier. 79 (1905) ; *H. laevigatum* subsp. *linguans* Zahn, l. c. 874 (1922).

Exsicc.—Ley, Haffes Glen, 1898, in Hb. Mus. Brit.

Aphyllopodous or *hypophyllopodous*. Stem about 50 cm. high, rather robust, \pm pilose, becoming floccose upwards. Leaves 7–10, deep green, rather large ; the basal oblong, obtuse-mucronulate, obscurely denticulate, attenuate below to \pm short, winged petioles, median oblong-elliptic to linear-oblong or lingulate, obtuse, sinuate-dentate or -denticulate, with sometimes 1–2 short, broad, mucronate teeth in the lower half, cuneate-based, sessile ; upper small and narrower, acute, sometimes entire ; all glabrescent on both surfaces, margins obscurely ciliate or scaberulous. Inflorescence racemose-corymbose, 4–8-headed, with long, suberect branches ; peduncles bracteolate and floccose, with occasional solitary pilose hairs. Heads rather large and broad, subtruncate-based. Phyllaries incumbent in bud, greyish green, broad, the outer \pm lax, linear-lanceolate, \pm obtuse, densely floccose, with \pm numerous unequal, short, dark glandular and fewer, longer, dark-based pilose hairs. Ligules glabrous-tipped. Styles fuscous. Margins of receptacle-pits dentate-fimbriate. Achenes blackish brown, 3.5–4 mm. long.

This rare plant, very sparingly represented in herbaria, was described by W. R. Linton from material collected by Ley in 1898 in Haffes Glen, Breconshire. In general facies it recalls *H. oligodon*, but it seems to be essentially a larger plant, with coarser foliage, densely floccose heads with fuscous styles, and fimbriate alveoles.

Distribution.—42. Brecon : Haffes Glen (Ley).

Endemic.

207. *HIERACIUM SUBSTRIGOSUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. rigidum var. *strigosum* Ley in Journ. Bot. xxxix. 168 (1901) ; *H. sparsifolium* var. *strigosum* W. R. Lint. Brit. Hier. 79 (1905) ; *H. laevigatum* subsp. *substrigosum* Zahn, l. c. 877 (1922).

Exsicc.—Linton no. 23 (as *H. lapponicum*) and 153 (as *H. rigidum* var. *longiciliatum*) ; Ley, Glyn Collwng, 1900, in Hb. Mus. Brit. ; Ley, Dyffryn Crawnon, 1900 ; Hanbury, Cwm Tarell, 1896 ; both in Hb. Hanbury.

Hypophyllopodous or *aphyllopodous*. Stem 30–100 cm. high, robust or flexuous, reddish about the base, densely pilose throughout with long, pale hairs, becoming

scaberulous as these wear away. *Leaves* 6–15, pale green, normally large; basal oval to elliptic-lanceolate, obtuse-mucronulate to subacute, remotely denticulate, contracted abruptly or not to long or short petioles; lower and median lanceolate or rhombic-lanceolate, long-acuminate, with a few coarse, unequal, often very long teeth about the middle, much attenuate below, shortly petioled or sessile; upper linear-lanceolate to linear, acuminate, generally with a few unequal teeth but sometimes almost laciniate, sessile; all clothed on both sides, especially beneath, with long, pale, bulbous-based hairs, margins shortly ciliate. *Inflorescence* normally loosely paniculate-corymbose, 3–20-headed, with long accladium and branches, often some from the upper leaf-axils; *peduncles* floccose, and densely pilose with long, spreading, pale, black-based hairs. *Heads* large and broad, rounded below. *Phyllaries* incumbent in bud, dark greyish or rarely blackish green (the inner with paler margins), \pm broad, linear-lanceolate, obtuse, effloccose, with dense, pale, dark-based pilose hairs, and round the base a few shorter, dark glandular hairs intermixed. *Ligules* glabrous-tipped. *Styles* yellow. Margins of receptacle-pits elevated, subulate-dentate. Achenes blackish brown, about 4 mm. long.

This plant was first collected by Ley on riverside rocks at the head of Cwm Tarell, Breconshire, in 1888, the specimens being of rather slender, flexuous habit with a few-headed inflorescence and broad, dark phyllaries. They were referred through Hanbury to Lindeberg, who returned them as '*H. lapponicum* var. nov.'. Ley subsequently discovered the more robust and normal form of the species, and decided that his earlier Cwm Tarell plant was conspecific with it, whereupon, seeing that it did not match *H. lapponicum*, he described it (l. c.) as *H. rigidum* var. *strigosum*. *H. substrigosum* has indeed little affinity with the Scandinavian *H. lapponicum* Fr., which is a relatively dwarf and slender plant with narrow foliage.

Distribution.—41. Glamorgan: Rhondda Valley (Riddelsdell). 42. Brecon: Cwm Tarell, Glyn Collwng, Nedd Glen, Dyffryn Crawnon and Abergwesyn (Ley). Hepste Glen (Hanbury). 44. Carmarthen: Carmarthenshire Fan (Riddelsdell). 48. Merioneth: Barmouth! 49. Carnarvon: Bethesda (Hanbury).

Endemic.

208. *HIERACIUM DONEGALENSE* sp. nov.

Ersicc.—Hart, Martin's Bridge (type in Hb. Hanbury) and Doocharry Bridge, 1894, as *H. rigidum* var. *scabrescens*; in Hb. Hanbury and Hb. Dublin.

Plantæ pseudophyllopoda. *Caulis* 50–70 cm., robustus, rubicundus, basin versus dense et grosse pilosus vel setosus, supra glabrescens. *Folia* 15–20, saturate viridia, inferne aggregata, superiora remotiora multo minora; basalia ovato- vel elliptico-lanceolata, acuta, remote denticulata ad irregulariter dentata, inferne in petiolum brevem alatum angustata; media elliptico-lanceolata ad lanceolata, acuminata, dentibus paucis longis argutis munita, basi cuneatâ sessilia; suprema similia, sed basi brevis cuneatâ, tandem lineari-lanceolata integra; omnia supra glabrescentia subtus floccosa (saltem superiora) et praesertim in costâ dorsali pilosa, marginibus irregulariter ciliatis vel scaberulis. *Anthela* ampla, paniculato-corymbosa, 10–20-cephala, ramis longis erectis accladium vulgo longum multo superantibus; pedunculi floccosi, raro pilis solitariis obsiti. *Involucra* majuscula, inferne in pedunculi apicem bracteolatum contracta. *Squamae* apice recurvatae (ap. Hart), obscure olivaceae (intimae pallide marginatae), lineari-lanceolatae, obtusae ad subacutae, in marginibus \pm floccosae, pilis numerosis basi obscuris glandulisque tenuibus brevibus immixtis obsitae. *Ligulae* apice glabrae. *Styli* fusci. Alveoli receptaculi margine subulato-dentati.

Pseudophyllopodous. *Stem* 50–70 cm. high, robust, reddish, densely and coarsely pilose towards the base, glabrescent upwards. *Leaves* 15–20, deep green, \pm crowded

below and much smaller and more distant above ; the basal ovate- or elliptic-lanceolate, acute, remotely denticulate or irregularly dentate, narrowed below to short, winged petioles ; median *elliptic-lanceolate* to lanceolate, acuminate, *with a few long, sharp teeth*, cuneate-based, sessile ; upper similar, but more shortly cuneate-based, becoming linear-lanceolate and entire ; all *glabrescent above*, pilose beneath, especially on the midrib, and floccose (at least the upper), margins irregularly ciliate or scaberulous. *Inflorescence ample, paniculate-corymbose, 10-20-headed, with long, erect branches* much exceeding the usually long acladium ; peduncles floccose, rarely with solitary pilose hairs. *Heads large, narrowed below to the bracteolate apex of the peduncle.* *Phyllaries* incumbent in bud, apically recurved (Hart), *dark olive-green* (the inner with paler margins), linear-lanceolate, *obtuse to subacute, ± floccose-edged, with numerous dark-based pilose and short, fine glandular hairs* intermixed. Ligules glabrous-tipped. *Styles fuscous.* Margins of receptacle-pits subulate-dentate. Achenes blackish brown, 3.5-4 mm. long.

This fine hawkweed was collected by Hart in 1894 near Martin's Bridge, on the Owengarve river, and at Doocharry Bridge, on the Gweebarra river, both in County Donegal ; and specimens from both stations were sent to Hanbury for determination. Hanbury's specimens are labelled '*H. rigidum* var. *scabrescens* Johansson'. The broad foliage aggregated towards the base of the stem and the long, erect panicle of large flower-heads clearly separate this plant from *H. rigidum* var. *scabrescens* and its allies, and it seems to belong to the Series *Sparsifolia* and to be more nearly related, on the whole, to *H. substrigosum* than any other British species. Hanbury's specimens are adequate and in good condition although their foliage is discoloured.

Distribution.

Ireland.—35. W. Donegal : Martin's Bridge and Doocharry Bridge (Hart).

Endemic.

209. *HIERACIUM GRANDESCENS* Dahlstedt in Acta Hort. Berg., Band 2, no. 4 (1893). *H. sparsifolium* subsp. *grandescens* Dahlst. H. Exs. iv. 96 (1891), nomen solum : *H. sparsifolium* var. *grandescens* W. R. Lint. Brit. Hier. 79 (1905) ; *H. laevigatum* subsp. *grandescens* Zahn, l. c. 873 (1922).

Exsicc.—Dahlst. H. Exs. iv. 96, in Hb. Mus. Brit. and Hb. Hanbury ; Dahlst. H. Sc. iv. 83-85, in Hb. Kew.

Aphyllopodous or hypophyllopodous. *Stem* (20-)40-60 cm. high, ± robust, purplish, slightly pilose below, becoming glabrescent and somewhat floccose upwards. *Leaves* 7-15, rather large, light green, glaucescent beneath ; the basal obovate-oblong, obtuse-mucronulate, sinuate-denticulate, attenuate below to ± long, winged petioles ; the median *lingulate-lanceolate* to lanceolate, acuminate, *with few irregular, sharp teeth in the lower half*, sessile with cuneate to rounded base ; upper small, ovate-lanceolate, deeply toothed to entire, sessile with rounded base ; all *glabrescent above*, slightly pilose beneath, with obscurely ciliate margins. *Inflorescence paniculate-corymbose, (2-)5-16(-25)-headed, the upper branches exceeding the short acladium*, and often long lower branches from the upper leaf-axils ; peduncles floccose, with a few scattered pilose hairs. *Heads large and broad, rounded below.* *Phyllaries ± porrect in bud, dark olive-green* (the inner with pale margins), broad, linear-lanceolate, obtuse, effloccose, *densely pilose with pale, dark-based hairs, with a few fine, dark glandular hairs* intermixed round the base. Ligules glabrous-tipped. *Styles livid.* Margins of receptacle-pits setaceous-subulate-dentate. Achenes blackish brown, about 4 mm. long.

This species was added to the British list on the basis of specimens collected by Mr. A. Wilson in 1892 and 1894 on banks of the river Lune, near Sedbergh, and now

in Herb. Hanbury. They are not exactly identical with Dahlstedt's type, for they differ in possessing rather broader and less lingulate foliage and in lacking the definitely short acladium that seems characteristic of *H. grandescens*. W. R. Linton (l. c.) cites also Berwyn, in Merioneth, for this species, but the specimens in Herb. Hanbury collected by Ley in this district (in bud only) bear more resemblance to the next species, *H. placerophylloides*. There is a good flowering specimen in Herb. Mus. Brit. (Marshall, no. 3744, Capel Curig, 1912), with a large, characteristic panicle and short acladium, that agrees with *H. grandescens* better than the Sedbergh examples. Another plant from Toderags, Yetholm, County Roxburgh, collected in 1878 by Brotherston, and now in Herb. Mus. Brit. with further cultivated examples, also resembles *H. grandescens*, but better material is necessary for certain determination.

Distribution.—49. Carnarvon: Capel Curig (Marshall). 65. N.W. Yorks: Sedbergh (A. Wilson).

General Distribution.—Sweden.

210. *HIERACIUM PLACEROPHYLLOIDES* sp. nov.

H. sparsifolium var. *placerophyllum* W. R. Lint. Brit. Hier. 78 (1905), non *H. sparsifolium* subsp. *placerophyllum* Dahlst. Hier. Exs. iv. 95 (1891), nec *H. laevigatum* subsp. *placerophyllum* Zahn, l. c. 873 (1922).

Icon.—Pl. 12, fig. a.

Exsicc.—Pugsley no. 810 (Teesdale) (type), in Hb. Pugsley: Percival, Hawes, 1888, and Glen Dovey, 1888; Ley, Llyn Duly, 1888; all in Hb. Hanbury; Ley, Chapel-le-Dale, 1901; Cryer, Ling Gill, 1912; both in Hb. Mus. Brit.

Planta aphyllopoda vel pseudophyllopoda. *Caulis* 25–60 cm., *flexuosus*, normaliter purpurascens, inferne vel interdum omnino *dense pilosus*, saepe per pilas trunciformes tandem scaberulus. *Folia* 6–12(–15), majuscula, saturate viridia; basalia elliptico-lanceolata, ± acuta, obscure sinuato-denticulata, inferne in petiolum brevem, alatum contracta; media lanceolata, acuminata, *dentibus paucis remotis grossis, saepe patulis munita, inferne longe attenuata in petiolum brevem alatum vel sessilia*; summa ovato-lanceolata, longe acuminata, grosse dentata ad integra, basi rotundatā sessilia; omnia *utrinque pilosa* vel superiora superne glabrescentia, marginibus ± obscure ciliatis scaberulisve. *Anthela* vulgo *paniculato-corymbosa*, (2–)5–16-*cephala*, *ramis suberectis* acladium superantibus, et in plantis validis ramis longis etiam e foliorum superiorum axillis; pedunculi floccosi pilis obscuris ± numerosis obsiti. *Involucra magna*, basi rotundata. *Squamae atrovirides* (extimae laxiusculae), *latiusculae*, lineari-oblongae, obtusae, subfloccosae, *pilis densis basi obscuris glandulisque obscuris brevioribus* vestitae. Ligulae apice glabrae. *Styli lutei ad fusci*. Alveoli receptaculi margine subulato-dentati.

Aphyllopodous or pseudophyllopodous. *Stem* 25–60 cm. high, *flexuous*, normally purplish, *densely pilose* below and sometimes throughout, often becoming scaberulous from the bases of the deciduous hairs. *Leaves* 6–12(–15), rather large, deep green; the basal elliptic-lanceolate, ± acute, obscurely sinuate-denticulate, contracted below to short, winged petioles; median lanceolate, acuminate, *with a few remote, coarse, often spreading teeth, long-attenuate below*, with short, winged petioles or sessile; upper ovate-lanceolate, long-acuminate, coarsely toothed or entire, sessile with rounded base; all *pilose on both surfaces* or the upper glabrescent above, margins ± obscurely ciliate or scaberulous. *Inflorescence* normally *paniculate-corymbose*, (2–)5–16-*headed*, *with suberect branches* exceeding the acladium, and in strong plants long lower branches from the upper leaf-axils; peduncles floccose, with ± numerous dark pilose hairs. *Heads large*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, the outer rather lax, rather broad, linear-oblong, obtuse, subfloccose, *with dense dark-based pilose hairs and some shorter, dark glandular hairs* intermixed. Ligules glabrous-tipped. *Styles yellow to fuscous*. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3.5 mm. long.

This plant has been identified with Dahlstedt's subspecies *placerophyllum*, which is founded on the *exsiccata* cited above. Dahlstedt's plant, as represented in Herb. Mus. Brit., Herb. Kew, and Herb. Hanbury, seems essentially distinct from the British specimens referred to it for, like *H. grandescens* Dahlst., it has both stem and foliage relatively smooth, with leaves definitely less attenuate towards the base than in the British form, and apparently of a lighter green. Its phyllaries, too, are paler in colour. The British plant is therefore described as a separate species. It is noteworthy that while most well-grown examples of *H. placerophyloides* have a strongly pilose or scaberulous stem and inflorescence, others, especially when weak or shade-grown, exhibit this feature in a very slight degree. The plant from Glen Dun, County Antrim, referred to var. *placerophyllum* by W. R. Linton (l. c.), seems to belong to the Section *Foliosa*.

Distribution.—48. Merioneth : Glen Dovey (Percival). Dinas Mawdduy and Cader Idris (Ley). 49. Carnarvon : Llyn Dulyd (Ley). 64. M.W. Yorks : Ribbleshead ! Ling Gill ! 65. N.W. Yorks : Winch Bridge (Baker). Hawes (Percival). 66. Durham : Langdon Beck, Teesdale ! St. John's, Weardale (Baker). 100. Clyde Is. : King's Cross (—).

Endemic.

211. *HIERACIUM HARTIANUM* sp. nov.

Exsicc.—Hanbury, Carrick River, 1891 (type), as *H. rigidum* var. *acrifolium*, in Hb. Hanbury ; Hart, eodem loco, 1884 and 1891, in Hb. Dublin.

Planta aphyllopoda vel pseudophyllopoda. *Caulis* 20–60 cm., *robustus*, erectus, inferne purpurascens, omnino pilosus interdum tandem scaberulus. *Folia* 10–15, saturate viridia, suberecta ; inferiora \pm purpureo-tincta, *elliptico-lanceolata*, \pm acuta, inaequaliter dentibus porrectis denticulato-dentata, inferne ad petiolum brevem attenuata vel subsessilia ; media superioraque lanceolata, acuminata, *dentibus inaequalibus longis curvatis denticulisque immixtis* munita, saepius basi cuneata, sessilia ; omnia *superne glabrescentia*, inferne parce pilosa, marginibus incrassatis scaberulis. *Anthela paniculato-corymbosa*, (3–)10–20-*cephala*, nonnunquam ramos inferiores e foliorum axillis emittens, pedunculis bracteolatis subfloccosis pilis numerosis patentibus obsitis. *Involucra mediocria*, basi rotundata. *Squamae atrovirides*, lineari-lanceolatae, obtusae, effloccosae, *pilis numerosis tenuibus ad minutis microglandulisque immixtis* vestitae. Ligulae apice glabrae. *Styli lutei*. *Alveoli receptaculi* margine subulato-dentati, *dentibus in setas longas erectas productis*.

Aphyllopodous or *pseudophyllopodous*. *Stem* 20–60 cm. high, robust, erect, purplish below, pilose throughout and sometimes becoming scaberulous. *Leaves* 10–15, deep green, suberect ; the lower \pm suffused with purple, *elliptic-lanceolate*, \pm acute, unequally denticulate-dentate with ascending teeth, attenuate below to short petioles or subsessile ; median and upper lanceolate, acuminate, *with unequal, long, curved teeth interspersed with denticulations*, mostly cuneate-based, sessile ; all *glabrescent above*, sparingly pilose beneath, the thickened margins scaberulous. *Inflorescence paniculate-corymbose*, (3–)10–20-headed, sometimes with lower axillary branches, the peduncles bracteolate and subfloccose with numerous spreading pilose hairs. *Heads of medium size*, rounded below. *Phyllaries* incumbent in bud, *blackish green*, linear-lanceolate, obtuse, effloccose, *clothed with numerous fine and minute pilose hairs with some microglands* intermixed. Ligules glabrous-tipped. *Styles yellow*. *Margins of receptacle-pits subulate-dentate with long, erect setaceous points*. Achenes blackish brown, about 3 mm. long.

This plant, dedicated to H. C. Hart, author of the 'Flora of Donegal', was discovered in 1884 by Hart near the hotel on the Carrick river, in County Donegal. The specimens were referred to Backhouse, who was puzzled by them and declined

to offer a definite opinion. In 1891 the plant was collected again by Hart and Hanbury. It was at first named '*H. auratum*' by Hanbury, which was subsequently altered to '*H. rigidum* Hartm. var. *acrifolium* Dahlst.'. Hanbury dried several good specimens, but unfortunately they were taken too early to show the character of the alveoles and the achenes, which can be better seen in Hart's original example in Herb. Dublin.

The species bears a resemblance in habit and foliage to some forms of *H. Backhouseanum*, but the inflorescence is more decomposed and the flower-heads smaller and different in form and clothing. The heads somewhat simulate those of the Section *Sabauda*, while the foliage also recalls that of *H. Stewartii*. The plant is placed with some doubt in the Series *Sparsifolia* of the *Tridentata*.

Distribution.

Ireland.—35. W. Donegal: Carrick River (Hart and Hanbury).

Endemic.

Series **Eu-Tridentata**. (See page 235.)

212. *HIERACIUM TRIDENTATUM* Fries, Symb. 171 (1848), ex parte; Epier. 116 (1862), ex parte; Backh. Mon. 67 (1856), ex parte; Dahlst. Bidrag, iii. 218 (1894); W. R. Lint. Brit. Hier. 80 (1905); *H. rigidum* var. *tridentatum* Hanb. in Bab. Man. ed. 9, 262 (1904); *H. laevigatum* subsp. *tridentatum* Zahn, l. c. 866 (1922).

Icon.—Pl. 12, fig. b.

Exsicc.—Dahlst. H. Exs. iii. 57, in Hb. Hanbury; Dahlst. H. Sc. v. 73 and 74, in Hb. Kew; Ley, Boughrood, 1886, in Hb. Hanbury; Druce, Hampstead Marshall, 1931, as *H. scabrescens*, in Hb. Druce.

Aphyllopodous or *hypophyllopodous*. Stem 40–60 cm. high, generally rather slender, *pilose*, chiefly towards the base and about the leaf-axils, \pm floccose above (in exposure sometimes more pilose and becoming scaberulous). Leaves 9–12(–15), bright or pale green; the lower *elliptic-lanceolate*, acute to acuminate, denticulate to *sharply and irregularly dentate with few \pm long, erect-spreading teeth*, sometimes with denticulations or finer teeth interspersed, long-attenuate below to long or short, winged petioles; median smaller and narrower, long-acuminate, with relatively longer, often somewhat curved teeth, sessile; upper linear-lanceolate, with 2–3 long teeth above the \pm rounded, sessile base; all *glabrescent* or more rarely pilose above, \pm pilose (and the upper or all sometimes also floccose) beneath, with shortly ciliate or scaberulous margins. Inflorescence *paniculate-corymbose*, 5–20(–40, cult.)-headed, with short, (and sometimes abortive) *accladium* and erect-spreading branches exceeding it, also frequently with long lower branches from the upper leaf-axils; peduncles slender, floccose and \pm pilose. Heads small or rather small, narrow, \pm bracteolate below the *subtruncate base*, constricted above after flowering. Phyllaries incumbent in bud, *olive-green with pale green tips and margins*, narrow, linear-oblong, obtuse or subacute, the outer obscurely floccose-edged, \pm densely clad with longer, dark-based and fine, pale pilose hairs, typically eglandular, but usually with \pm numerous glandular hairs in British examples. Ligules glabrous-tipped. Styles yellow to livid. Margins of receptacle-pits dentate to subulate-dentate. Achenes blackish brown, about 3 mm. long.

f. *glandulosiceps* (Zahn) comb. nov.

H. tridentatum var. *typicum* Rouy, Fl. Fr. ix. 396 (1905); *H. laevigatum* subsp. *tridentatum* var. *genuinum* sub-var. *glandulosiceps* Zahn, l. c. 867 (1922).

Exsicc.—Pugsley no. 811, in Hb. Pugsley.

Phyllaries with numerous dark glandular but no pilose hairs. Otherwise like the type.

β. polyphyllum (Zahn) comb. nov.

H. laevigatum subsp. *tridentatum* var. *polyphyllum* Zahn, l. c. 867 (1922).

Exsicc.—Pugsley no. 812, in Hb. Pugsley; Linton no. 44, as *H. rigidum* var. *scabrescens*; W. F. Miller, Addington, 1889; both in Hb. Hanbury; Lacaita, Selham, 1909; in Hb. Mus. Brit.

Stem normally tall and robust, often subfistular, 50–100(–160 ap. Backhouse) cm. high, more densely pilose and floccose than in the type. Leaves 15–30, long and narrow; the basal very long, lanceolate, acuminate, with a few \pm irregular teeth, gradually attenuate below to \pm long, winged petioles; median long and narrow, elliptic-lanceolate to lanceolate, long-acuminate, generally with long, narrow, spreading and often curved teeth. Inflorescence many-(–50)-headed; phyllaries generally slightly floccose towards the base, with \pm numerous dark glandular hairs, epilose or with \pm numerous pilose hairs. Otherwise typical.

H. tridentatum is stated by Fries (l. c.) to be an aphyllopodous plant with corymbs of relatively pale heads whose phyllaries are shortly pilose but rarely glandular. The exsiccatae which he sent out under this name, however, are not homogeneous. In 1889 Dahlstedt issued his exsiccata, H. Exs. iii. 57, to represent his conception of Fries's species. This is a rather slender and short plant, with pilose, eglandular phyllaries, collected near Christiania. Four years later he sent out another set, H. Sc. v. 74, with the same plant cultivated. The later specimens match the earlier ones except that a few stalked glands are present among the pilose hairs of their phyllaries. This may indicate that the presence or absence of glandular hairs in this species is an unfixed character. Zahn states (l. c.) that his subspecies *tridentatum*, which has a wide distribution, is very variable, that it may have broad or narrow foliage, with short or long teeth, and that its phyllaries may be pilose and glandular in varying degree or wholly glandular. He does not admit a form with eglandular phyllaries. In view of Fries's original description the typical form of *H. tridentatum* should apparently possess phyllaries that are eglandular or nearly so, as in Dahlstedt's above-mentioned two sets of exsiccatae.

Among British specimens I have traced none in which the phyllaries are really eglandular, and in the majority their indumentum is more or less predominantly glandular. Forms nearly agreeing with Dahlstedt's specimens in other respects occur in various localities in England and Wales, and these are here treated as typical *H. tridentatum*, provided that their phyllaries are in some degree pilose. A taller, coarser plant with long, narrow leaves and frequently very glandular phyllaries is prevalent in the south of England, and this appears separable as a form of Zahn's variety *polyphyllum*. Zahn admits another variety *daedalum* Stenström, which seems to be characterized chiefly by pilose heads larger than in the typical species. Similar relatively large heads may sometimes be seen in Britain among both dwarf and tall plants, but as no specimens have been traced in which the large heads are predominantly pilose, it is undesirable to take up Stenström's varietal name. It is noticeable that in cut-back or mutilated plants abnormally large heads in relatively small numbers are often developed. A form with small, dark heads, growing at Tal-y-llyn, in Merioneth, probably belongs to this species but needs further investigation. No examples of the species have been traced from Scotland or Ireland.

In W. R. Linton's handbook *H. tridentatum* var. *acrifolium* appears as British, based on Dahlstedt's *H. acrifolium*, which Zahn maintains as a distinct subspecies. Dahlstedt's type (H. Exs. iii. 61 and 62) is well represented in Herb. Mus. Brit. and Herb. Hanbury, and is a small, slender plant, with a few long, narrow, slightly toothed leaves and dark, glandular, epilose heads, unlike any British specimens seen. Most of our plants so named, including Linton no. 71, are forms of *H. tridentatum* with moderately glandular heads.

H. obatrescens (Dahlst.) is another plant shown as British by W. R. Linton. The type of this (Dahlst. H. Exs. i. 99, as *H. pullatum*) is also in Herb. Mus. Brit. and Herb. Hanbury. It is another rather slender plant, with few, very long, narrow,

toothed leaves and rather large, dark, pilose heads. All the British examples seen so named are widely different plants.

H. Friesii Hartm. is likewise included in W. R. Linton's handbook. This is well represented by the exsiccata Lindeberg H. Sc. iii. 81, a tall plant with glabrous stem, numerous narrow, sessile and floccose leaves, and many dark, nearly glabrous heads. It seems to show an approach to species of the Section *Foliosa*. None of the British specimens so named that have been examined is identical with this plant, which appears to have been confused in the handbook with *H. lineatum* Alm., a further addition of Linton's to the British list.

H. scabrescens (Johansson ex Dahlst.), like the preceding, has been credited to the British flora. There are good sheets of the type of this plant (Dahlst. H. Exs. ii. 100) in Herb. Mus. Brit. and Herb. Hanbury, which show it to be a slender form doubtfully separable from typical *H. tridentatum*. Its phyllaries are pilose and eglandular, and I can find no definite criteria to distinguish it. It is essentially different from all the British material, including Linton no. 44, that has been referred to it.

The identity of *H. rigidum* Hartm., also treated as British by W. R. Linton, has been a matter of dispute, but it seems fairly clear that it is best represented by the exsiccata Lindeberg H. Sc. iii. 76. This is in Herb. Mus. Brit. and Herb. Hanbury, but I have seen no British specimens that show its combination of slender habit, narrow, finely acuminate, toothed foliage and dark heads.

The inherent improbability of the forms of this group inhabiting south Britain proving identical with so many of those growing in Scandinavia has apparently not been appreciated.

In Journ. Bot. xlix. 356 (1911) Linton described a new variety *rubefactum* of *H. rigidum*, a plant with lanceolate, slightly dentate foliage, and effloccose, nearly epilose phyllaries, with fairly numerous unequal glands. This variety was found at Chapel-en-le-Frith and above Baslow, in Derbyshire, and at Rhayader, in Radnor. The only material seen (in Herb. Mus. Brit.) was collected by W. R. Linton in 1898 at Chapel-en-le-Frith, and consists of two slender plants, nearly past flowering. They are not forms of *H. tridentatum*, and the dark heads resemble those of *H. boreophilum* but are smaller and less densely glandular. The growth is aphyllipodous, and the leaves approach those of typical *H. rigidum*. This plant should perhaps be treated as a separate species when more and better material is available.

H. tridentatum was first distinguished in Britain by Petiver (Catalogue of Mr. Ray's English Herball (1713)) in two forms, as long or narrow-leaved, hairy hawkweed of 'Hamsted Woods'. The two forms are clearly figured (Pl. xiii. f. 8 and 10). Petiver is followed by Dillenius (Synopsis, ed. 3, 168 (1724)), who shows the plants as *Pulmonaria fruticosa longifolia* (and *angustifolia hirsuta*). I have myself collected this species on Hampstead Heath.

Distribution.—5. S. Somerset : Kingston (Marshall). 8. S. Wilts : Pitton (Grose). 9. Dorset : Branksome (Moyle Rogers). 11. S. Hants : Bournemouth (Ley). New Forest (Rayner). 12. N. Hants : Headley (P. M. Hall). 13. W. Sussex : Selham (Marshall). 14. E. Sussex : Groombridge and Brighton (Hilton). Broadwater Forest! 16. W. Kent : Cranbrook (Marshall). Blackheath (Straker). Lamberhurst! Tunbridge Wells! 17. Surrey : Addington (W. F. Miller). Witley (Marshall). E. Horsley! Byfleet (Lousley). Leith Hill! Headley (E. Forster). 18. S. Essex : Barking (E. Forster). 21. Middlesex : Hampstead Heath! 22. Berks : Hampstead Marshall (Druce). 23. Oxford : Shotover (Riddelsdell). 30. Beds : Ampthill (E. Forster). 33. E. Glo'ster : Cranham (Day). 34. W. Glo'ster : King's Stanley (Reader). 36. Hereford : Grwyne and Hunstham Hill (Ley). 41. Glamorgan : Aberdare (Riddelsdell). 42. Brecon : Boughrood and Glyn Collwng (Ley). 43. Radnor : Cwm Elan (Ley). 48. Merioneth : Blaenau (Ley). 62. N.E. Yorks : Thirsk (Foggitt). 64. M.W. Yorks : Wensley Dale (F. A. Lees).

f. glandulosiceps.

11. S. Hants : Hayling Is. ! Hordean ! 12. N. Hants : Liphook ! 16. W. Kent : Cranbrook (Marshall). Tunbridge Wells ! 17. Surrey : Witley ! 22. Berks : Boar's Hill (Druce).

var. polyphyllum.

4. N. Devon : Tiverton (Still). 9. Dorset : Parkstone (Linton). 12. N. Hants : Hook (Rayner). 13. W. Sussex : Bexley Hill (Burdon). Horsham (White). Selham (Lacaita). 14. E. Sussex : Crawley (Marshall). Groombridge ! Eridge ! 16. W. Kent : E. Grinstead (Hanbury). Tunbridge Wells (Gibson). Pembury ! 17. Surrey : Tilford (Marshall). Frensham ! Sunninghill ! Keston ! Thursley (Lousley). Waverley (Burdon). Ockham (Wallace). Oxshott ! Witley ! Chobham Ridges (Ward). Addington (W. F. Miller). 19. N. Essex : Tiptree Heath (Brown). 22. Berks : Aldermaston and Crowthorne (Druce). 34. W. Glo'ster : Woodchester (Reader). 53. S. Lincs : Skellingthorpe (Fisher). 58. Cheshire : — (Dr. Wood).

General Distribution.—France. Central Europe. Scandinavia. Russia.

213. *HIERACIUM SCABRISSETUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. tridentatum var. *setigerum* Ley ex W. R. Lint. Brit. Hier. 81 (1905) ; *H. laevigatum* subsp. *scabrisetum* Zahn, l. c. 892 (1922).

Ersicc.—Ley, Drws-y-Nant and Cwm Croesor, 1903, in Hb. Mus. Brit. ; Ley, Glyn Neath, 1890 ; Hanbury, Torpantau, 1896 ; both in Hb. Hanbury.

Pseudophyllopodous or *aphyllopodous*. Stem 20–40(–65) cm. high, rather robust, densely pilose or scaberulous, and ± floccose above. Leaves 10–20, dull green ; the basal oval-lanceolate, obtuse to acute, denticulate to remotely sinuate-dentate, attenuate below to short, winged petioles ; median oblong-lanceolate, acute, coarsely and unequally serrate, sessile with shortly cuneate base, upper lanceolate to linear-lanceolate, acuminate, irregularly dentate towards the base to entire, sessile with ± rounded base ; all pilose and floccose on both surfaces, or glabrescent above, margins shortly ciliate. Inflorescence paniculate-corymbose, often apically subumbellate, (5–)10–20(–30)-headed, with erect-spreading or arcuate (sometimes subumbellate) branches much exceeding the short accladium ; peduncles floccose with ± numerous spreading, dark-based pilose and occasionally some glandular hairs. Heads of medium size, rounded below. Phyllaries incumbent in bud, dark olive-green, linear-lanceolate, obtuse to subacute, sparingly floccose towards the base, with ± numerous long and short, dark glandular hairs, with pilose hairs intermixed. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits sharply dentate. Achenes blackish brown, 2.75–3 mm. long.

This plant is closely allied to *H. tridentatum*, but is more densely pilose and floccose. Its inflorescence is also more umbellate, and its heads rather larger, and broader with rounded base. As in *H. tridentatum*, the head of the accladium is sometimes abortive.

Distribution.—41. Glamorgan : Glyn Neath (Ley). Aberdare (Riddelsdell). 42. Brecon : Torpantau (Hanbury). 48. Merioneth : Drws-y-Nant and Festiniog (Ley).

Endemic.

214. *HIERACIUM CANTIANUM* F. J. Hanbury in Journ. Bot. xxxii. 232 (1894) ; in Bab. Man. ed. 9, 263 (1904) ; W. R. Lint. Brit. Hier. 80 (1905) ; *H. laevigatum* subsp. *cantianum* Zahn, l. c. 892 (1922).

Exsicc.—Linton no. 45 (Witley); Marshall no. 463 (Cranbrook); both in Hb. Hanbury; Salmon, Graffham, 1902, in Hb. Mus. Brit.

Aphyllopodous or slightly pseudophyllopodous. *Stem* 40–80 cm. *high, densely pilose* with spreading hairs in the lower half, less so but becoming also floccose above. *Leaves* 10–20(–35), yellowish or more rarely dull green; the basal elliptic-oblong, obtuse-mucronulate, denticulate to \pm shallowly sinuate-dentate, attenuate below to \pm short petioles; lower and median *elliptic-oblong* to elliptical, obtuse or subacute to shortly acuminate, irregularly *sinuate-dentate* with sometimes long and narrow, ascending teeth, sessile with long to short, cuneate base; *upper* decreasing, ovate-lanceolate, \pm shortly acuminate, irregularly toothed, *sessile with broad, rounded base*; all *pilose on both surfaces*, especially beneath, sometimes glabrescent above, the under surface (at least of the upper leaves) also floccose, margins long-ciliate. *Inflorescence paniculate-corymbose*, (5–)10–25(–35)-headed, with slender, erect-spreading branches exceeding the accladium, and sometimes long lower branches from the upper leaf-axils, peduncles floccose with some solitary pilose or glandular hairs. *Heads small, rounded below*. *Phyllaries* incumbent in bud, *dark olive-green, rather broad*, linear-lanceolate, obtuse, effloccose, *with \pm numerous dark glandular and pilose hairs and some microglands*. Ligules glabrous-tipped. *Styles yellow*. Margins of receptacle-pits shortly dentate. Achenes blackish brown, 2.5–2.75 mm. long.

β . *subrigidum* Linton, Hier. Exs. no. 154 (1901), nomen solum; Hanb. in Bab. Man. ed. 9, 263 (1904); W. R. Lint. Brit. Hier. 80 (1905).

Exsicc.—Linton no. 154, in Hb. Mus. Brit. and Hb. Hanbury; Marshall no. 1820, in Hb. Hanbury.

Generally pseudophyllopodous. Leaves narrower than in the type, the basal lanceolate-oblong, the lower and median elliptic-lanceolate to lanceolate, with longer, narrower teeth, upper with shortly contracted but not broadly rounded base. Heads rather larger than in the type, with densely floccose peduncles. Phyllaries \pm floccose towards the base, with rather dense, dark-based pilose and very few, solitary glandular hairs. Styles fuscous. Otherwise like the type.

This plant, which was discovered by E. S. Marshall in 1889 near Cranbrook, in Kent, and subsequently found more abundantly in Surrey, is very distinct from the characteristic deep but relatively obtuse toothed of its broad foliage, and its panicle of small heads with broad phyllaries. The Aberdare plant has densely glandular and pilose phyllaries and should perhaps be varietally separated.

Distribution.—13. W. Sussex: Selham (Marshall). Graffham (Salmon). 14. E. Sussex: Groombridge! Tunbridge Wells (Hilton). 16. W. Kent: Cranbrook (Marshall). Bedgebury! Pembury! 17. Surrey: Witley! Thursley (Groves). 41. Glamorgan: Aberdare (Riddelsdell).

var. *subrigidum*.

13. W. Sussex: Graffham (Marshall). 17. Surrey: Witley (Marshall).

Endemic.

215. *HIERACIUM NIDENSE* (F. J. Hanbury) Roffey in Lond. Cat. ed. 11 (1925).

H. rigidum var. *nidense* Hanb. in Journ. Bot. xxxii. 231 (1894); in Bab. Man. ed. 9, 262 (1904); W. R. Lint. Brit. Hier. 82 (1905); *H. laevigatum* subsp. *nidense* Zahn, l. c. 883 (1922).

Exsicc.—Linton no. 119; Ley, Melte Glen, 1892; both in Hb. Hanbury; Ley, Cellwen, 1899, in Hb. Mus. Brit.

Aphyllopodous or *hypophyllopodous*. *Stem* 35–90 cm. *high, slender, pilose* about the base, sparingly so and somewhat floccose upwards. *Leaves* 10–14, light green, relatively large and normally thin; the basal and median *long-lanceolate*, finely

acuminate, with a few unequal, long and sharp, ascending teeth, long-attenuate below to short petioles; the upper smaller, linear-lanceolate, long-acuminate, with a few sharp teeth towards the shortly cuneate base, sessile; all pilose on both surfaces or the upper glabrous above, the upper sometimes also floccose beneath, margins shortly ciliate and scaberulous. Inflorescence normally racemose-corymbose, 2-9(-20, cult.)-headed, with long, slender, suberect branches exceeding the long accladium; peduncles finely bracteolate, floccose, with a few solitary pilose hairs. Heads rather large, narrowed below and subtended by fine bracteoles. Phyllaries semi-perrect in bud, olive or dark olive-green, rather narrow, linear-oblong, obtuse, slightly floccose below, with many fine, dark glandular hairs and microglands, and fewer longer pilose hairs intermixed. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits sharply dentate. Achenes blackish brown, about 3.5 mm. long.

This rather handsome hawkweed is readily distinguished by its elongate, deeply cut foliage and its small, lax panicle of large heads. The involucre recalls those of *H. tridentatum* but are much larger and more contracted below.

Ley records this species (Journ. Bot. xlvii. 53 (1909)) for several stations in Breconshire.

42. Brecon : Melte Glen. Hepste Glen. Tawe Glen (Cellwen)(Ley).

Endemic.

216. *HIERACIUM TRICHOCAULON* (Dahlstedt) Roffey in Lond. Cat. ed. 11 (1925).

H. rigidum subsp. *trichocaulon* Dahlst. Bidrag, iii. 235 (1894); *H. laevigatum* subsp. *affine* var. *trichocaulon* Williams, l. c. 169 (1902); *H. rigidum* var. *trichocaulon* W. R. Lint. Brit. Hier. 83 (1905); *H. laevigatum* subsp. *trichocaulon* Zahn, l. c. 880 (1922).

Esicc.—Dahlst. H. Exs. iii. 64, in Hb. Mus. Brit. and Hb. Hanbury; Linton no. 25; Hanbury, Bournemouth, 1890; both in Hb. Hanbury.

Aphyllopodous or *hypophyllopodous*. Stem (30-)50-90 cm. high, \pm robust, purplish below, long-pilose, chiefly about the base and the leaf-axils, glabrescent above. Leaves 8-15, deep green, sometimes suffused with purple beneath; basal oval to oblong, rounded-obtuse-mucronulate to subacute, subentire to denticulate or obscurely sinuate-dentate, attenuate below to short, winged petioles; median lanceolate or elliptic-lanceolate, acute to acuminate, with a few unequal, \pm short and spreading (or in British plants coarse and longer) teeth, sessile with cuneate base or the lowest sometimes shortly petioled; upper ovate-lanceolate, long-acuminate, with 1-2 often large and coarse teeth towards the shortly cuneate or rounded, sessile base; all glabrescent or sparingly pilose above, pilose (especially on the midrib) and the upper sometimes also floccose beneath, with shortly ciliate or scaberulous margins. Inflorescence paniculate-corymbose, (2-)6-15(-30)-headed, with suberect branches exceeding the accladium, and often long, suberect lower branches from the upper leaf-axis; peduncles floccose, rarely with some solitary pilose hairs. Heads of medium size, rounded to subtruncate below. Phyllaries incumbent in bud, olive-green (inner with paler margins), linear-lanceolate, obtuse to subacute, usually effloccose, with numerous unequal, dark-based pilose hairs and sometimes many dark (usually shorter) glandular hairs intermixed. Ligules glabrous-tipped. Styles yellowish to fuscous. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3 mm. long.

The British plants referred to this species seem essentially identical with Dahlstedt's original exsiccata cited above; the Bournemouth specimens differ chiefly in their somewhat coarser habit, with the lower leaves sometimes more distinctly petiolate; in many of our examples the foliage is more coarsely and deeply dentate, and the

phyllaries more glandular than in Dahlstedt's plant. The restriction of our plant to the south of England casts a doubt on its identity with the Scandinavian species.

H. trichocaulon differs from *H. tridentatum* in its fewer, darker, and more coarsely toothed leaves, the basal more shortly petioled, in its stricter inflorescence and in its larger, broader and less truncate-based heads. It usually flowers in June, about a month earlier than *H. tridentatum*.

Distribution.—6. N. Somerset : Ebbor (D. Fry). 9. Dorset : Parkstone (Ley). Studland (Lousley). 11. S. Hants : Bournemouth (Hanbury). 13. W. Sussex : Lodsworth (Barton). 14. E. Sussex : Tunbridge Wells ! 15. E. Kent : Seal Chart (Mrs. Atkins). 16. W. Kent : Pembury ! 17. Surrey : Godstone (Marshall). Haslemere ! Witley (Roffey). Holmbury (Wallace). 33. E. Glo'ster : Cirencester (Greenwood).

General Distribution.—Scandinavia.

217. *HIERACIUM EBORACENSE* sp. nov.

H. tridentatum var. *decipiens* Ley in Journ. Bot. xlvii. 52 (1909) ?

Ersicc.—Ley, Gorstley, 1893 (type) and Harewood End, 1894 ; both in Hb. Hanbury ; Backhouse, Langwith, 1863, as *H. tridentatum*, in Hb. Backhouse ; Ley, Much Birch, 1878, and Wenlock Edge, 1904 ; both in Hb. Mus. Brit.

Planta aphyllopoda raro hypophyllopoda. *Caulis* 50–100 cm., *elatior*, \pm *robustus*, saepe rubescens, praesertim ad basin foliorum axillasque pilosus, superne parce floccosus. *Folia* 10–25(–30), laete ad saturate viridia, in exemplaribus validis conferta, in umbrosis remota minus dentata ; basalia ovato- vel elliptico-lanceolata, obtuso-mucronulata ad acuta, denticulata vel sparsim dentata, inferne in petiolum brevem alatum contracta ; inferiora mediaque elliptico- ad rhomboideo-lanceolata, acuminata, *dentibus inaequalibus argutis porrectis* (interdum angustissimis) \pm *numerosis* denticulisque nonnunquam intermixtis munita, inferne longe attenuata, sessilia vel inferiora in petiolum brevem alatum interdum angustata ; superiora ovato-lanceolata, longe acuminata, vulgo dentibus nonnullis angustis valde inaequalibus praedita, basi rotundatâ sessilia ; omnia *utrinque* (praesertim inferne in costâ dorsali) *pilosa*, aut superne glabrescentia, superiora saepe etiam in paginâ inferiore floccosa, marginibus breviter ciliatis vel scaberulis. *Anthela paniculato-corymbosa*, *apice* \pm *subumbellata*, 10–30(–50)-*cephala*, (2–10 in umbrosis), ramis suberectis (saepe e foliorum superiorum axillis longis) aeladium superantibus ; pedunculi floccosi pilis paucis solitariis obsiti. *Involucra mediocria*, *basi rotundata*. *Squamae olivaceae* (interiores marginibus pallidis), lineari-lanceolatae, obtusae, paulo floccosae, hinc inde leviter senescentes, *pilis multis basi obscuris glandulis brevioribus microglandulisque* immixtis vestitae. Ligulae apice glabrae. *Styli fusci ad lividi*. *Alveoli receptaculi margine dentibus in setas longas erectas productis subulato-dentati*.

Aphyllopodous, rarely hypophyllopodous. *Stem* 50–100 cm. high, tall and \pm *robust*, often reddish, pilose, chiefly about the base and leaf-axils, sparingly floccose above. *Leaves* 10–30, bright to deep green, crowded in strong plants, remote and less toothed when weak or shade-grown ; basal ovate- or elliptic-lanceolate, obtuse-mucronulate to acute, denticulate or sparingly toothed, contracted below to short, winged petioles ; lower and median *elliptic- to rhomboid-lanceolate*, acuminate, with \pm *numerous*, *sharp*, *unequal*, *ascending teeth* (some very narrow), sometimes interspersed with denticulations, \pm *long-attenuate* below, sessile or the lower shortly petiolate ; upper ovate-lanceolate, long-acuminate, usually with several very unequal, narrow teeth, sessile with rounded base ; all *pilose on both surfaces* (or glabrescent above), especially on the midrib beneath, upper often also floccose beneath, margins shortly ciliate or scaberulous. *Inflorescence paniculate-corymbose*, *apically* \pm *subumbellate*, 10–30(–50)-*headed*, (2–10 in shade-forms), with suberect branches (often long from the upper leaf-axils) exceeding the aeladium, peduncles floccose with a few solitary pilose hairs. *Heads of medium*

size, rounded below. *Phyllaries* incumbent in bud, olive-green (the inner with paler margins), linear-lanceolate, obtuse, a little floccose and occasionally slightly senescent, with many dark-based pilose hairs mixed with shorter glandular hairs and microglands. Ligules glabrous-tipped. *Styles* fuscous to livid. *Margins of receptacle-pits* subulate-dentate, the teeth produced into long, erect setae. Achenes blackish brown, about 3 mm. long.

This hawkweed seems to be most nearly allied to *H. trichocaulon* (Dahlst.), but separable by its more leafy stem, with more closely and sharply toothed foliage; also by its normally more floriferous panicle of flower-heads, and especially its peculiarly setose-margined alveoles, which is apparently a constant feature. It seems to have been first distinguished by Ley (l. c.) as a variety *decipiens* of *H. tridentatum*, but although his brief description is fairly clear, he did not mention the alveoles, and the *exsiccatæ* there enumerated do not appear homogeneous. Ley thought the form especially frequent in Hereford, but there are many specimens in herbaria from various stations in Yorkshire, including the city of York, and its name, as a new species, has been chosen accordingly. A number of examples, especially from this county, have small, few-headed panicles and seem at first sight distinct, but more ample material suffices to show that they are only a shade-form of the normal more robust and many-headed plant.

Distribution.—12. N. Hants : Fleet (R. H. Hall). 14. E. Sussex : Lane-end Common (Hilton). Broadwater Forest! 15. E. Kent : Saltwood (Marshall). 16. W. Kent : Lamberhurst! 17. Surrey : Cobham (Groves). 34. W. Glo'ster : Hewellsfield (Shoolbred). Minchinhampton (Day). 35. Monmouth : Chepstow (Morgan). 36. Hereford : Gorstley and Harewood End (Ley). 37. Worcester : Powick (Towndrow). 40. Shropshire : Bridgnorth (W. Allen). Much Wenlock (Ley). 41. Glamorgan : Llwydcoed (Riddelsdell). 42. Brecon : Boughrood (Ley). 49. Carnarvon : Bettws-y-Coed! 56. Notts : Blyth (Fisher). 57. Derby : Sturston and Atlow (W. R. Linton). 62. N.E. Yorks : Scarboro' (Cryer). Holdgate, York (Hb. Backhouse). Langwith (Backhouse). 64. M.W. Yorks : Wharfedale (Cryer). Harrogate (Linton). 65. N.W. Yorks : Teesdale (Baker). Bainbridge (F. A. Lees). Middleton-in-Teesdale! Sedbergh (Handley). 66. Durham : Bishop Auckland (Soutter). Stockton (Backhouse). Hart (Fox). 69. Westmorland : Barras (Riddelsdell). 110. Outer Hebrides : Allt Valagir, S. Uist (Heslop Harrison).

Endemic.

218. *HIERACIUM RHAYADERENSE* sp. nov.

H. boreale × *sciaphilum* Hanb. in Journ. Bot. xxxii. 232 (1894).

Exsicc.—Hanbury, Rhayader, 1889 (type), in Hb. Hanbury.

Planta aphyllopoda. *Caulis* 50–70 cm., robustus, erectus, pilosus (praesertim ad basin) scaberulusque, sursum ± floccosus. *Folia* 8–10, olivaceo-viridia, remota, suberecta; inferiora elliptico-oblonga, remote denticulata, obtuso-mucronata ad subacuta, inferne sensim attenuata ad petiolum ± brevem alatum; media lanceolata, irregulariter denticulata vel dentibus paucis remotis porrectis in dimidio inferiore munita, subacuta ad acuta, basi breviter cuneatâ sessilia; summa minora, lanceolata, acuminata, basin sessilem leviter rotundatam versus dentibus uno duobusve porrectis; omnia utrinque pilis rigidis sparsis vestita, marginibus inferiorum ciliatis superiorum scaberulis. *Anthela* ampla, paniculato-corymbosa, 5–15(–22)-cephala, ramis longiusculis erecto-patulis acladium saepe superantibus (inferioribus e foliorum superiorum axillis longioribus), pedunculi ± floccosi, pilis ± numerosis basi obscuris patentibus obsiti. *Involucra* mediocria ad majuscula, basi rotundata. *Squamæ* saturate olivaceae, interiores marginibus pallidioribus, lineari-lanceolatae, obtusae, circa basin parce

floccosae, glandulis \pm numerosis tenuibus inaequalibus obscuris et microglandulis nonnullis, fere epilosae. Ligulae apice glabrae. Styli lutei. Receptaculi alveoli margine breviter inciso-dentati.

Aphyllopodous. Stem 50–70 cm. high, robust, erect, pilose, chiefly below, and scaberulous, becoming \pm floccose above. Leaves 8–10, olive-green, distant and suberect; the lower elliptic-oblong, remotely denticulate, obtuse-mucronate to subacute, gradually attenuate below to \pm short, winged petioles; median lanceolate, irregularly denticulate or with a few distant, ascending teeth in the lower half, subacute to acute, with sessile, shortly cuneate base; uppermost smaller, lanceolate, acuminate, with one or two ascending teeth towards the sessile, slightly rounded base; all with scattered, stiff pilose hairs on both surfaces, the lower with ciliate, the upper with scaberulous margins. Inflorescence ample, paniculate-corymbose, 5–15(–22)-headed, with rather long, erect-spreading branches often exceeding the accladium (longer lower ones from the upper leaf-axils); peduncles \pm floccose with \pm numerous dark-based, spreading pilose hairs. Heads of medium size to rather large, rounded below. Phyllaries incumbent in bud, deep olive-green (the inner with paler margins), linear-lanceolate, obtuse, slightly floccose about the base, with \pm numerous fine, unequal, dark glandular hairs and some microglands, almost epilose. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits shortly incise-dentate. Achenes reddish black, about 3 mm. long.

This plant, which is well represented by eleven good sheets in Herb. Hanbury, was first collected by Ley in 1888 on a railway bank near Rhayader, in Radnor. The following year Hanbury visited the spot, and although Lindeberg dissented from the identification, he reported the plant (l. c. supra) as a hybrid, *H. boreale* \times *sciaphyllum*. In gathering his specimens he took examples of what he considered to be the parent species; one is *H. anglorum*, the other a vigorous shoot, hardly in bud, of one of the *Sabauda* Section. Although Hanbury thought the new plant a hybrid, I fail to find any features that look intermediate between those of *H. anglorum* and *H. boreale* sensu lato. The relatively few, distant and suberect leaves are very characteristic, and resemble those of neither of the reputed parents; the heads are as large as normally in *H. boreale* and twice the size of those of *H. anglorum*; the phyllaries are narrower than in *H. boreale* and not concolorous; and there is no trace of fibrillose teeth on the margins of the alveoles, as might be expected if one parent was *H. boreale*. Zahn, who appears to have seen a specimen of this plant, refers it to his *H. Luescheri*, a Central European species of his group *Sabauda-Vulgata*, but its characters do not fully agree with his brief description (Mon. p. 957), and the identification is too doubtful for acceptance. The plant seems best treated as a member of the group *Eu-Tridentata* and is accordingly described as a new species *H. rhayaderense*.

Distribution.—43. Radnor: Rhayader (Ley).

Endemic.

219. *HIERACIUM LISSOLEPIUM* (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. lineatum Almq. ex Stenstr. Värml. Archier. 72 (1889); *H. rigidum* subsp. *lineatum* Dahlst. Bidrag, iii. 240 (1894); W. R. Lint. Brit. Hier. 84 (1905); non *H. lineatum* Arv.-Touv. (1888); *H. laevigatum* subsp. *lissolepium* Zahn, l. c. 887 (1922).

Exsicc.—Dahlst. H. Exs. iii. 68 and 69, in Hb. Hanbury; Dahlst. H. Sc. x. 91, in Hb. Kew; Riddelsdell, Cwm Haffes, 1902, in Hb. Mus. Brit., as *H. trichocaulon*.

Aphyllopodous. Stem 40–90 cm. high, erect, sometimes slightly pilose at the base, otherwise glabrous. Leaves 10–20, light green, paler beneath, the lower oblong-lanceolate to lanceolate, \pm acute, remotely and irregularly sinuate-denticulate,

long-attenuate below to \pm short, winged petioles or sessile; median and upper lanceolate to linear-lanceolate, acuminate, *remotely denticulate to dentate*, sessile with cuneate to rounded base; the uppermost small, narrowly ovate-lanceolate, long-acuminate, \pm dentate, sessile with rounded base; all *glabrescent above and floccose* (especially the upper) *beneath*, the lower sometimes also \pm pilose, margins scaberulous, very sparingly ciliate. *Inflorescence paniculate-corymbose*, 4-10(-25)-headed, with erect-spreading branches exceeding the short accladium, and sometimes longer ones from the upper leaf-axils; peduncles floccose. *Heads small to medium in size, rounded below*. *Phyllaries* incumbent in bud, *blackish green*, the outer lax or with recurved tips, linear-lanceolate, mostly obtuse, *efloccose* or nearly so, *epilose and eglandular*, or with a few solitary pilose or glandular hairs. Ligules glabrous-tipped. *Styles fuscous to livid*. Margins of receptacle-pits dentate. Achenes blackish brown, 3.5-4 mm. long.

H. lissolepium is well represented in the above-cited exsiccatae, and as understood by Dahlstedt and Zahn, is a somewhat variable species. W. R. Linton (l. c.) cites it for Skye, Derbyshire and Carnarvon, but the only British specimens seen were collected by Riddelsdell in Cwm Haffes, Breconshire, and as an abnormal pseudo-phyllopodous form, by Hanbury near Bethesda. In both cases the flower-heads are rather larger than those of Dahlstedt's specimens. The species appears to form a connecting link between the *Tridentata* and *Foliosa*.

Distribution.—42. Brecon : Cwm Haffes (Riddelsdell). 49. Carnarvon : Bethesda (Hanbury).

General Distribution.—Scandinavia. Central Europe.

C. APHYLLOPODA Godet. (See page 32.)

Sect. XI. FOLIOSA.

Fries, *Epier.* 123 (1862); Hanb. in Bab. Man. ed. 9, 265 (1904), non Zahn; *Prenanthoidea* and *Foliosa*, W. R. Lint. Brit. Hier. 84 and 87 (1905), ex parte; *Sabauda* Williams, l. c. 84 (1902), ex parte; *Tridentata-Prenanthoidea* and *Umbellata-Prenanthoidea* Zahn, l. c. 895 and 918 (1922).

Aphyllopodous plants with leafy stems; the lowest leaves (often withered by the time of flowering) narrowed below but rarely distinctly petiolate, the median and upper sessile and \pm amplexicaul; all paler or glaucescent beneath and \pm distinctly reticulate-veined; leaf-margins \pm thickened, those of the lower leaves generally ciliate, of the upper scaberulous. Inflorescence paniculate-corymbose (except in *H. tavense*, *H. pycnotrichum* and *H. obesifolium*), occasionally \pm pilose, with \pm numerous, often large heads. Phyllaries incumbent in bud, appressed, obtuse, commonly with \pm numerous glandular hairs but sparingly pilose or floccose, often also microglandular. Ligules glabrous-tipped (unless in *H. strictiforme*). Styles pure yellow to dark livid. Margins of receptacle-pits \pm sharply dentate, sometimes with setaceous-pointed or fimbriate teeth. Achenes purplish or blackish brown.

Flowering August–September.

The British species placed in this Section, although allocated under two of his intermediate groups by Zahn, seem really to constitute a more homogeneous assemblage of forms than do many of the recognized generic Sections. Only *H. maritimum* and *H. obesifolium* stand apart as differing widely from the other species. *H. Listerae*, *H. Bartonii*, and some forms of *H. neocorymbosum* and *H. reticulatum* are conspicuous plants with elegant foliage and handsome flower-heads. All of the species favour riverside rocks in hilly districts, and in the north of Scotland sea-cliffs and sandy shores.

The hawkweeds of this Section are distributed over Central Europe, and from Scandinavia eastwards across Russia into Siberia and westwards to Iceland and Greenland. Of the sixteen species here described as British, of which twelve appear to be endemic, twelve are found in the highlands or north of Scotland, and of these four are confined to that region. Four only are known from southern Scotland. In the north of England seven species have been recognized, whereof two, *H. Bakeranum* and *H. pycnotrichum*, are not known elsewhere. The Welsh species are eight, of which one, *H. tavense*, is peculiar to the principality. The group is not represented in central or southern England. Examples of six species have been seen from Ireland, none endemic to that country. Four of them inhabit Antrim or Down, four grow in Wicklow, and two (*H. opsianthum* and *H. maritimum*), in Donegal.

Series *Corymbosa* [Grex *H. corymbosum* Fr.].

Robust plants. Median leaves \pm elliptic-lanceolate, shortly dentate, with \pm shortly cuneate base. Panicle generally with many medium-sized heads; phyllaries \pm glandular, sparingly pilose.

- Leaves dull or yellowish green, with \pm cuneate base. Panicle compact or spreading; heads rounded below; phyllaries dark olive-green. Styles yellow *H. latobrigorum*.
- Leaves numerous, bright green, rather broad, with rounded base. Panicle compact; heads rounded below; phyllaries dark olive-green, densely microglandular. Styles fuscous or livid *H. Drummondii*.
- Leaves deep green, glabrescent, with shortly cuneate to rounded base. Panicle generally spreading; heads \pm subtruncate-based (larger in var. *crocatiforme*); phyllaries blackish green, broad. Styles dark livid *H. neocorymbosum*.
- Leaves olive-green, with shortly cuneate to rounded base. Panicle \pm compact; heads truncate-based; phyllaries blackish green, broad, nearly glabrous. Styles dark livid *H. subcrocatum*.

Series *Salicifolia* [Grex *H. salicifolium* Lindbg.].

Rather slender plants. Median leaves \pm elliptic-lanceolate, denticulate, shortly cuneate-based. Panicle with fewer, medium-sized heads; phyllaries glandular, scarcely pilose.

- Leaves dull green, lanceolate to ovate-lanceolate, \pm floccose. Panicle with straight, suberect branches; heads \pm narrowed below; phyllaries blackish green, broad-based, dark-glandular. Styles livid *H. Bartonii*.
- Leaves dull green, elliptic to rhombic-lanceolate. Panicle elongate; heads rounded below; phyllaries blackish green, broad, dark-glandular and slightly pilose. Styles yellow *H. subpolyphyllum*.

Series *Stricta* [Grex *H. strictum* Fr.].

Robust plants. Median leaves lingulate to ovate-lanceolate, subentire to strongly dentate, rounded-based. Panicle with \pm numerous and large heads; phyllaries with many glandular or pilose hairs.

- Leaves yellowish green, lingulate-lanceolate, long-acuminate, with narrow or cusped teeth. Panicle lax; heads narrowed below; phyllaries blackish green, dark-glandular, \pm pilose and microglandular. Styles yellow *H. reticulatum*.
- Leaves deep green, lingulate-lanceolate, acute, subentire. Panicle compact or lax; heads truncate-based; phyllaries dark olive-green, densely dark-glandular, also pilose and microglandular. Styles livid *H. strictiforme*.
- Leaves deep green, elliptic-lanceolate, acute, sharply toothed. Panicle with long or short branches; heads broad, truncate-based; phyllaries blackish green, broad, very pilose and glandular. Styles livid *H. opsianthum*.
- Leaves bright green, linear-oblong, acute, denticulate. Panicle with \pm long branches; heads truncate-based; phyllaries blackish green, finely glandular, \pm pilose. Styles livid *H. Listerae*.

Series *Angusta* [Grex *H. angustum* Lindbg.].

Robust or slender plants. Median leaves \pm lanceolate, subentire to denticulate-dentate, \pm rounded-based. Panicle with few to many, small to medium-sized heads; phyllaries \pm glandular, epilose.

- Robust. Leaves pale green, long-lanceolate, denticulate, with semi-amplexicaul base. Panicle with slender branches; heads medium-sized, rounded below; phyllaries dark olive-green, sparingly glandular. Styles yellow. [dentatum]. *H. pseudampli-*
- Slender. Leaves light green, linear-oblong, irregularly denticulate, with rounded base. Panicle elongate; heads medium-sized, narrowed below; phyllaries blackish green, broad-based, dark-glandular. Styles yellow. *H. Bakeranum.*
- Slender. Leaves dull green, lanceolate, denticulate, with rounded base. Panicle racemose, few-headed; heads small, subtruncate-based; phyllaries dark olive-green, densely fine-glandular. Styles yellow. *H. tivense.*
- Robust. Leaves pale green, linear-oblong, subentire, with rounded base. Panicle compact and racemose; heads of medium size, truncate-based; phyllaries dull olive-green, dark-glandular and microglandular. Styles livid. *H. pycnotrichum.*

Series *Maritima* [Grex *H. maritimum* Hanb.].

Dwarfer plants. Median leaves suberect, thick, linear-oblong to lanceolate, subentire, rounded-based. Panicle with few, large heads; phyllaries slightly glandular, epilose.

- Stem asperous above. Leaves dark green, ligulate, with slightly rounded base. Panicle with erect-spreading, asperous branches; heads large and broad, truncate-based; phyllaries blackish green, very broad. Styles orange. *H. maritimum.*
- Stem glabrescent. Leaves dull olive-green, oblong-lanceolate, with semi-amplexicaul base. Panicle racemose, with thick branches; heads large and broad, truncate-based; phyllaries blackish green, broad. Styles deep yellow. *H. obesifolium.*

Series *Corymbosa*. (See page 271.)

220. HIERACIUM LATOBRIGORUM (Zahn) Roffey in Lond. Cat. ed. 11 (1925).

H. inuloides subsp. *latobrigorum* Zahn, l. c. 898 (1922); *H. auratum* Hanb. in Journ. Bot. xxvi. 205 (1888); in Bab. Man. ed. 9, 266 (1904); W. R. Lint. Brit. Hier. 88 (1905); non Fries, Symb. 181 (1848) ap. Zahn; *H. rigidum* Backh. Mon. 76 (1856); *H. Johnstonii* Dahlst. in Johnston, Add. Fl. Orkney, xv. 8-9 (1932); *H. aestivum* subsp. *hemitrachys* Druce and Zahn in B.E.C. Report, ix. pt. 5, 561 (1932).

Icones.—Zahn, l. c. fig. 61 a, 1-4; Pl. 13, fig. a.

Ersicc.—Linton nos. 74 (Perth, as *H. corymbosum*) and 99 (Roy Bridge, as *H. auratum*); Hanbury, Braemar, 1887, Killin, 1888, and Inveroran, 1889; all in Hb. Hanbury; Backhouse, Clova, 1850, as *H. rigidum*, in Hb. Backhouse.

Stem 30-80(-100) cm. high, \pm robust, reddish towards the base, pilose to glabrescent in the lower half, glabrescent to densely floccose above. Leaves 12-25, dull or yellowish green, \pm conspicuously veined beneath; lower oblanceolate to oblong, obtuse to acute, subentire or remotely denticulate, attenuate below to (usually short) winged petioles; median elliptic- to rhombic-lanceolate, \pm acuminate, remotely and irregularly denticulate to shortly or sparingly dentate, sessile with cuneate or (especially the upper) rounded base; upper ovate-lanceolate to lanceolate, acuminate, sparingly toothed to subentire, sessile with rounded, semi-amplexicaul base; all glabrescent or the upper \pm floccose above, pilose, and at least the upper, floccose beneath, margins densely scaberulous, occasionally slightly ciliate. Inflorescence compactly racemose-corymbose, with short, suberect branches, to paniculate-corymbose, with long, spreading branches (often finely foliaceous) from the upper leaf-axils, 3-25(-45)-headed; branches and peduncles usually densely floccose, rarely with some solitary pilose hairs. Heads of medium size to rather large, rounded below.

Phyllaries incumbent in bud, *dark olive-green*, rather broad, linear-lanceolate, obtuse, scarcely floccose, with numerous, unequal, dark glandular hairs and microglands, sometimes with fewer and longer pilose hairs intermixed. Ligules glabrous-tipped (florets occasionally stylose). Styles pure yellow. Margins of receptacle-pits setaceous-subulate-dentate. Achenes dark purplish brown, 3-3.75 mm. long.

f. angustifolium forma nova.

Exsicc.—Hanbury, Altnaharra, 1887 (type), in Hb. Hanbury.

Caulis gracilis. Folia denticulata vel superiora subintegra, quam in typo angustiora (elliptico-oblonga ad anguste ovato-lanceolata), basi magis rotundata semiamplexicaulia. Anthela 2-6-cephala; squamae nonnunquam pilis longis numerosis vestitae.

Stem slender. Leaves denticulate or the upper subentire, narrower than in the type (elliptic-oblong to narrowly ovate-lanceolate) but with more rounded, semiamplexicaul base. Inflorescence 2-6-headed, phyllaries sometimes with many long, pilose hairs. Otherwise like the type.

This species was first confused with *H. rigidum* Hartm. by Backhouse (l. c.) and was subsequently reported from several Scottish stations by Hanbury (l. c.) under the name of *H. auratum* Fr. It had been identified by Lindeberg. *H. auratum* was originally described by Fries as a North American species which was naturalized on an old wall at Uppsala, and in his *Epicrasis* he remarks that he thinks he had seen it from other northern parts of Europe. Zahn (l. c. 955) transfers *H. auratum* from the Section *Foliosa*, where it had been placed by Fries, to the *Sabauda*, and gives it as a plant of Central Europe but not of Britain. The British plant, which is stated by Zahn also to occur in Central Europe, he partly renames *H. latobrigorum*, and partly refers to a new variety *pseudauratum* of *H. striatum* Tausch. Under *H. latobrigorum*, which is shown as a plant with yellow styles, he includes the British *H. corymbosum* of W. R. Linton, which has livid styles; and he cites under it Linton no. 74 and Linton no. 99, pp. from Argyll. The first of these sets, as represented in Herb. Hanbury, shows a yellow-styled plant that is not *H. corymbosum* of British botanists although sent out under that name. The sheet of Linton no. 99 in Herb. Hanbury, issued as *H. auratum*, has likewise a yellow-styled plant (from Bridge of Roy) that seems conspecific with no. 74. British botanists would regard both specimens as *H. auratum* Fr. Zahn also cites Linton no. 99 pp. under *H. striatum* var. *pseudauratum*, and apparently the plant that he saw came from Hoy, in Orkney, where the same *H. auratum* of British authors grows. The Hoy plant, as seen in herbaria, does not agree with Zahn's account of *H. striatum* Tausch and its variety, and presents no essential points of difference from other British *H. auratum*. It is difficult to see why Zahn created the variety *pseudauratum*, and only with some misgiving can I abandon the name *H. auratum* for our plant in favour of *H. latobrigorum*. Zahn's variety *pseudauratiforme* of *H. latobrigorum* from Kean (Reay ?), in Caithness, seems an unstable form only.

Zahn further gives *H. inuloides* Tausch as occurring at 'Rakon in Argyle', but no British examples of this species have been observed. It is a relatively dwarf plant with narrow leaves and moderate-sized heads with nearly naked phyllaries; it is represented in Herb. Mus. Brit. by the exsiccata F. Schultz, Herb. Norm. 545, from Hohnneck, in the Vosges.

H. Johnstonii Dahlst. in Johnston's 'Additions to the Flora of Orkney', xv. 8-9 (1932), is a plant of this group represented by a fair sheet in Herb. Mus. Brit. It is founded on seven specimens collected on Pegal Head, Hoy, on 13th August 1931. In Herb. Hanbury there are six sheets of examples obtained by the Pegal burn, two by Syme in 1875, two others from J. B. T. Fortescue in 1880, and a further two by Johnston in 1894. These have been named *H. auratum* by Elfstrand and Hanbury. On comparing the sheet of *H. Johnstonii* with these earlier exsiccatae, I fail to find any real difference and believe that all the specimens are forms of *H.*

latobrigorum. The foliage in most of them is relatively narrow, and in some pilose hairs appear on the peduncles and the phyllaries, but this does not seem a constant feature and can hardly warrant even varietal separation.

In August 1931, G. C. Druce also collected specimens in Pegal Bay which he referred to Zahn for determination. Zahn described them as a new subspecies *hemitrachys* of *H. aestivum* grex *crocatum*. The specimens, now in Herb. Druce, were seen, after their determination, by Johnston, who noted on the sheet that he believed them identical with Fortescue's specimens of 1880. This is no doubt correct; the examples are poor, starved plants of *H. latobrigorum*.

A specimen of *H. latobrigorum* in Herb. Druce (Burdon, Killin, 1917) has been referred to *H. polycomum* Dahlst.

H. latobrigorum is the commonest British species of the Section *Foliosa*. A fine set of the form *angustifolium* was collected by Hanbury at Altnaharra in 1887.

H. fruticosum latifolium glabrum, which is recorded for 'Hulswater in Westmorlandia' in Ray's *Historia*, v. 1 (1686), appears from the brief diagnosis in the *Synopsis*, p. 44 (1690) to be this species. It is figured by Petiver (*Cat. Pl. xiii. f. 9* (1713)).

Distribution.—39. Stafford : Warslow (W. R. Linton). 49. Carnarvon : Nant Francon (Ley). 65. N.W. Yorks : Teesdale ! 69. Westmorland : Pooley Bridge ! 70. Cumberland : Alston (Baker). 72. Dumfries : Sanquhar (Davidson). 73. Kirkcudbright : Glen (Linton). 86. Stirling : Carron (Stirling). 87. W. Perth : Strathyre (Groves). Glen Devon (Syme). 88. Mid Perth : Loch Rannoch (Miss Todd). Killin ! Crianlarich ! Lochearnhead (Buchanan-White). Lawers (Marshall). Strathfillan (Linton). Fortingal (W. F. Miller). 89. E. Perth : Loch Tummel (Lousley). Blairgowrie ! 90. Forfar : Clova (Backhouse). 92. S. Aberdeen : Braemar (Hanbury). Aberdeen (Beeby). 94. Banff : Bridge of A'an (Roffey). Tomintoul (Marshall). 96. E. Inverness : Beaully River (Marshall). Kincaig (Somerville). 97. W. Inverness : Glen Garry (Fisher). Glen Nevis and Roy Bridge (Marshall). 98. Argyll : Loch Tulla (Hanbury). Kingshouse (Marshall). Inveroran (Hanbury). Dalmally (Druce). 99. Dumbarton : Arrochar (Marshall). 104. N. Ebudes : Skye (W. R. Linton). 105. W. Ross : Ullapool and Applecross (Druce). 107. E. Sutherland : Brora River and Bonar Bridge (Marshall). 108. W. Sutherland : Bettyhill ! Altnaharra and Tongue (Hanbury). 109. Caithness : Thurso ! Dunbeath and Reay (Hanbury). 111. Orkney : Pegal Bay (Syme).

Ireland.—20. Wicklow : Lake Dan (Brunker). 38. Down : Hilltown and Annalong (Praeger). 39. Antrim : Cushendun (Shoolbred). Cranfield (Stewart).

f. *angustifolium*.

98. Argyll : Kingshouse (Marshall). 108. W. Sutherland : Altnaharra (Hanbury).

General Distribution.—Central Europe (ap. Zahn).

221. *HIERACIUM DRUMMONDII* sp. nov.

Exsicc.—Drummond, Linnell, 1876 (type) and Aberdona, 1876, as *H. strictum* var. *opsianthum*; both in Hb. Hanbury and Hb. Mus. Brit.

Caulis 50–100 cm., *elatior, robustus*, basin versus rubescens et glabrescens, ad medium \pm pilosus, tandem sursum leviter floccosus. *Folia numerosa* (20–)30–45, nisi in caulis parte inferiore conferta, *laete viridia*, inferne pallidiora reticulata; inferiora anguste obovato-oblonga ad late lanceolata, obtuso-mucronata ad acuta, subintegra ad remote sinuato-denticulata, in petiolum brevem alatum \pm longe attenuata, sursum sensim sessilia; media *late vel elliptico-lanceolata*, acuminata, \pm grosse *inaequaliter denticulato-dentata*, basi *rotundatâ ad semi-amplexicauli sessilia*; summa conspicue minora, ovato-lanceolata, acuminata, irregulariter dentata, basi amplexicauli sessilia; omnia utrinque breviter pilosa vel superne glabrescentia, superiora tandem utrinque epilosa inferne \pm floccosa, marginibus inferiorum \pm ciliatis

superiorum \pm scaberulis. *Anthela compacte paniculato-corymbosa*, 15–35-cephala, ramis gracilibus suberectis \pm confertis, inferioribus nonnunquam foliatis; pedunculi floccosi, raro pilis patulis solitariis obsiti. *Involucra mediocria* ad satis parva, *basi rotundata*. *Squamae obscure olivaceae* (interiores pallide marginatae), lineari-oblongae, obtusae ad subacutae, ad basin floccosae, *dense microglandulosae, glandulis tenuibus obscuris inaequalibus numerosis pilisque paucis paulo longioribus immixtis* vestitae. Ligulae apice glabrae. *Styli fusci vel lividi*. Alveoli receptaculi margine subulato-dentati \pm fimbriati.

Stem 50–100 cm. high, *tall and robust*, reddish and glabrous towards the base, \pm pilose about the middle, becoming slightly floccose upwards. *Leaves numerous*, (20–)30–45, crowded except in the lower part of the stem, *bright green*, paler and reticulate beneath; lower narrowly obovate-oblong to broadly lanceolate, obtuse-mucronate to acute, subtire to remotely sinuate-denticulate, \pm long-attenuate below to short, winged petioles, becoming sessile upwards; median *broadly or elliptic-lanceolate*, acuminate, \pm *coarsely and unequally denticulate-dentate, sessile with rounded to semi-amplexicaul base*; upper conspicuously smaller, ovate-lanceolate, acuminate, irregularly dentate, with sessile, amplexicaul base; all shortly pilose on both surfaces or glabrescent above, the upper becoming epilose on both sides and \pm floccose beneath, margins \pm ciliate or, of the upper leaves, scaberulous. *Inflorescence compactly paniculate-corymbose*, 15–35-headed, with slender, suberect, \pm crowded branches, the lower sometimes leafy; peduncles floccose, rarely with solitary, spreading pilose hairs. *Heads of medium size* or rather small, *rounded below*. *Phyllaries incumbent* in bud, *dark olive-green* (the inner with paler margins), linear-oblong, obtuse to subacute, floccose about the base, *densely microglandular, with numerous fine, dark, unequal glandular and a few rather longer pilose hairs* intermixed. Ligules glabrous-tipped. *Styles fuscous or livid*. Margins of receptacle-pits subulate-dentate, \pm fimbriate. Achenes dark purplish brown, about 3.5 mm. long.

This plant is described from a fine series of specimens in Herb. Hanbury collected in 1876 by T. Drummond at Linnell and Aberdona, in County Clackmannan, and formerly referred to *H. strictum* var. *opsianthum* Dahlst. In foliage they are not unlike var. *opsianthum*, but their stems are more vigorous and much more leafy; and their flower-heads, relatively small, with narrow, glandular rather than pilose phyllaries, are entirely different. It was also obtained in 1933 by Corstorphine between Careston Station and Fern, in Forfarshire.

Distribution.—87. W. Perth and Clackmannan: Linnell and Aberdona (Drummond). 90. Forfar: Careston (Corstorphine).

Endemic.

222. *HIERACIUM NEOCORYMBOSUM* sp. nov.

H. corymbosum W. R. Lint. Brit. Hier. 87 (1905), excl. loc. camb. (pp.) et hibern.; non Fries, Symb. 185 (1848), nec Backh. Mon. 77 (1856), nec Persoon, Syn. ii. 374 (1807).

Exsicc.—Fox, Grasmere, 1890 (type), as *H. corymbosum*, in Hb. Mus. Brit.

Caulis (35–)50–100 cm., *robustus*, striatus, glabrescens, interdum parce pilosus vel scaberulus. *Folia* 15–35, *saturate viridia*, inferne pallidiora et, saltem superiora, valde reticulata; inferiora \pm anguste obovato-lanceolata, obtuso-mucronulata ad acuta, subintegra ad remote denticulata, basi longe attenuatâ sessilia; media *elliptico-lanceolata*, acuta ad acuminata, *denticulata ad breviter dentata, basi breviter cuneatâ ad rotundatâ sessilia*; summa ovato-lanceolata, acuminata, irregulariter serrato-dentata ad subintegra, basi semi-amplexicauli sessilia; omnia utrinque *glabrescentia*, vel inferiora nonnunquam leviter pilosa, marginibus parce irregulariter ciliatis vel scaberulis. *Anthela paniculato-corymbosa*, (5–)15–25(–30)-cephala, *apicem*

versus ramos breviusculos et saepius inferne e foliorum superiorum axillis longiores erecto-patentes a capitulis subumbellatis breviter pedunculatis terminatos emittens; ramis pedunculisque parcissime floccosis, his raro sparsim pilosis. Involucra mediocria ad majuscula, basi rotundata vel subtruncata. Squamae atrovirides (interiores nonnquam pallidiores), latae, lineari-lanceolatae, obtusae, effloccosae, glandulis obscuris inaequalibus ± numerosis obsitae, vulgo epilossae. Ligulae apice glabrae. Styli obscure lividi. Alveoli receptaculi margine breviter dentati. Pappus leviter rufo-tinctus.

Stem (35-)50-100 cm. high, *robust*, striate, glabrescent, sometimes sparingly pilose or scaberulous. *Leaves* 15-35, *deep green*, paler and strongly reticulate (at least the upper) beneath; the lower ± narrowly obovate-lanceolate, obtuse-mucronulate to acute, subentire to remotely denticulate, sessile with long-attenuate base; median *elliptic-lanceolate*, acute to acuminate, *denticulate to shortly dentate, sessile with shortly cuneate to rounded base*; upper ovate-lanceolate, acuminate, irregularly serrate-dentate to subentire, with sessile, semi-amplexicaul base; all *glabrescent* on both surfaces, or the lower sometimes slightly pilose, with sparingly and irregularly ciliate or scaberulous margins. *Inflorescence* *paniculate-corymbose*, (5-)15-25(-30)-headed, *with rather short branches above, and generally subumbellate, shortly peduncled heads at the end of long, erect-spreading branches from the axils of the upper leaves*; branches and peduncles very sparingly floccose, the latter rarely with a few pilose hairs. *Heads of medium size or rather large, rounded or subtruncate below. Phyllaries* incumbent in bud, *blackish green* or almost black (the inner sometimes paler), *broad, linear-lanceolate, obtuse, effloccose, with ± numerous dark, unequal glandular hairs, usually epilose. Ligules glabrous-tipped. Styles dark livid.* Margins of receptacle-pits shortly dentate. Achenes dark purplish brown, 3.5-4 mm. long. Pappus slightly rufous.

β. crocatiforme var. nov.

Exsicc.—W. A. Clark, Scotasay, 1941 (type); J. W. Heslop Harrison, Uamaslett, 1941; both in Hb. Heslop Harrison.

Caulis gracilior, pilis patulis ± hirsutus. Folia pauciora, etiam summa subintegra vel obscure denticulata, inferiora pilosa, superiora ± floccosa. Anthela interdum pauci-(2-3)-cephala; involucra quam in typo majora, squamis latissimis fere atris, eis *H. crocati* Fr. subsimilibus praedita.

Stem slenderer, ± pilose with spreading hairs. Leaves fewer, even the upper subentire or obscurely denticulate, the lower pilose, the upper ± floccose. Inflorescence sometimes few-(2-3)-headed; heads larger than in the type, with very broad, almost black phyllaries recalling those of *H. crocatum* Fr. Otherwise like the type.

This species is normally distinguished from *H. latobrigorum* by its less pilose and floccose indumentum, its wide-branching panicle with shortly peduncled heads, its darker and broader phyllaries, its dark livid instead of yellow styles, and its shortly dentate alveoles. It seems to be widely though sparingly distributed over the hilly districts of Britain.

It appears to be the plant chiefly intended as *H. corymbosum* in W. R. Linton's 'British Hieracia', but it is not the plant either of Backhouse or of Fries. *H. corymbosum* of Backhouse is a Braemar plant with yellow styles, and the specimen from Braemar in his herbarium is a form of *H. reticulatum* Lindbg. Fries (l. c.) describes a dark-styled plant from Central Europe as *H. corymbosum*, and cites as its *locus classicus*, Feldberg in Germany. His *exsiccata*, H. Eur. no. 140, from Feldberg, is a relatively dwarf plant, with narrow, serrate leaves and small heads, which is probably not British. Zahn (l. c. 904) has re-named this plant *H. tridentatifolium*, *H. corymbosum* Fries being a later homonym of *H. corymbosum* Persoon, Syn. ii. 374 (1807).

The variety *crocatiforme* often grows in a condensed form that looks very distinct and simulates *H. crocatum* Fr., but this is probably the effect of environment, for other larger specimens clearly show their affinity with *H. neocorymbosum*.

Distribution.—49. Carnarvon : Dolawen (—). 57. Derby : Chapel-en-le-frith (W. R. Linton). 65. N.W. Yorks : Teesdale (Mennell). 66. Durham : Middleton-in-Teesdale (Mennell). 69. Westmorland : Ullswater! Grasmere (Fox). 87. W. Perth : Strathyre (Kidston). Glen Devon (Syme). 88. Mid Perth : Lawers (Linton). Crianlarich (Hanbury). 90. Forfar : Glen Isla (Corstorphine). 94. Banff : Bridge of A'an (Roffey). 97. W. Inverness : Moidart (Macvicar). 98. Argyll : Dalmally (Marshall). 109. Caithness : Dunbeath (Hanbury). 110. Outer Hebrides : Eriskay (R. B. Cooke). Stornoway (Rimington). N. Uist (Wilmott). Barra (Heslop Harrison).

Ireland.—20. Wicklow : Lake Dan (Brunker).

var. *crocatiforme*.

110. Outer Hebrides : Scotasay (W. A. Clark). S. Harris (Heslop Harrison).

Endemic ?

223. *HIERACIUM SUBCROCATUM* (Linton) Roffey in Lond. Cat. ed. 11 (1925).

H. strictum var. *subcrocatum* Lint. in Journ. Bot. xxxi. 200 (1893); Hanb. in Bab. Man. ed. 9, 266 (1904); W. R. Lint. Brit. Hier. 86 (1905); *H. aestivum* subsp. *subcrocatum* Zahn, l. c. 925 (1922).

Exsicc.—Linton, Moffat, 1889, in Hb. Mus. Brit; Linton no. 120 and Mennell, Teesdale, 1886; both in Hb. Hanbury.

Stem 40–60 cm. high, rather robust, reddish below, ±pilose in the lower half, glabrescent above. Leaves 18–30, olive or yellowish green, ±reticulate-veined beneath; lower oblong-obovate, obtuse-mucronulate to acute, subentire to remotely denticulate, long-attenuate below, the lowest sub-petiolate; median elliptic-lanceolate, acute to acuminate, with a few short, ±spreading teeth, sessile with shortly cuneate to rounded base; upper often very small, ovate-lanceolate, acuminate, ±sparingly dentate, sessile with rounded or cordate, semi-amplexicaul base; all pilose on both surfaces with bulbous-based hairs, or the upper glabrescent above; margins shortly ciliate. Inflorescence generally compactly paniculate-corymbose, more rarely with long lower branches as in *H. neocorymbosum*, 3–8(–30)-headed, peduncles floccose, with occasional solitary pilose hairs. Heads of medium size, truncate-based. Phyllaries incumbent in bud, blackish green, broad, linear-lanceolate, obtuse, effloccose or nearly so, with a few solitary pilose or glandular hairs. Ligules glabrous-tipped. Styles dark livid. Margins of receptacle-pits setaceous-subulate-dentate. Achenes dark purplish brown, 3–3.5 mm. long. Pappus slightly rufous.

This plant was described as a variety of *H. strictum* by Linton, but it appears more nearly allied to *H. neocorymbosum*, from which it is best separated by its smaller growth, more hirsute foliage, normally more compact panicle, and truncate-based heads with nearly glabrous phyllaries.

It seems to be a local species, occurring chiefly in Dumfries.

Distribution.—48. Merioneth : Ganllwyd (Crosfield). 49. Carnarvon : Bethesda (Linton). Llyn Dilyn (Ley). 65. N.W. Yorks : Winch Bridge! 66. Durham : High Force (Backhouse). Middleton-in-Teesdale (Mennell). 69. Westmorland : Patterdale and Lorton (Oliver). 72. Dumfries : Sanquhar (Davidson). Moffat (Linton). 79. Selkirk : Galashiels!

Endemic.

Series *Salicifolia*. (See page 271.)

224. *HIERACIUM BARTONII* sp. nov.

Exsicc.—Barton no. 514 (type); Ley, Llanwrtyd, 1887, and Melte Glen, 1892; both in Hb. Hanbury; all as *H. corymbosum*.

Caulis 30–90 cm., *gracilescens*, in dimidio inferiore interdum sparsim pilosus scaberulusve, sursum glabrescens. *Folia* 15–25(–30), normaliter membranacea, *sordide viridia* inferne pallidiora; inferiora obovato-oblonga ad lanceolata, obtusomucronulata ad acuta, subintegra ad obscure denticulata, inferne longe attenuata vix petiolata; media *lanceolata ad ovato-lanceolata*, acuta ad acuminata, remote *sinuato-denticulata* (rarius \pm dentata), *basi abrupte cuneatâ ad rotundatâ* sessilia; summa ovato-lanceolata (nonnunquam late), acuminata, subintegra vel dentibus argutis paucis munita, basi rotundatâ semi-amplexicauli sessilia; omnia in paginâ superiore *glabrescentia vel superiora \pm floccosa*, in inferiore floccosa (basalia etiam \pm pilosa), marginibus molliter ciliatis vel scaberulis. *Anthela racemoso-ad paniculato-corymbosa*, 3–12(–25)-cephala, *ramis rigidis suberectis* (rarius ex axillis supremis ramis longioribus) praedita; pedunculis gracilibus floccosis. *Involucra mediocria ad majuscula, inferne \pm contracta*. *Squamae obscure vel atro-virides*, lineari-lanceolatae *e basi latâ attenuatae*, \pm obtusae, fere effloccosae, *glandulis nigricantibus numerosis* obsitae, epilosae. Ligulae apice glabrae. *Styli lividi*. Alveoli receptaculi margine setaceo-subulato-dentati. Pappus rubescens.

Stem 30–90 cm. high, \pm *slender*, sometimes sparingly pilose or scaberulous in the lower half, otherwise glabrescent. *Leaves* 15–25(–30), normally thin, *dull green* and paler beneath; lower obovate-oblong to lanceolate, obtuse-mucronulate to acute, subentire to obscurely denticulate, long-attenuate below but scarcely petioled; median *lanceolate to ovate-lanceolate*, acute to acuminate, distantly *sinuate-denticulate* (more rarely \pm dentate), sessile *with shortly cuneate to rounded base*; upper ovate-lanceolate (sometimes broadly), acuminate, subentire or with a few \pm deep, sharp teeth, sessile with rounded, semi-amplexicaul base; all *glabrescent* or the upper \pm *floccose* above, floccose and the lower \pm pilose beneath, margins softly ciliate or scaberulous. *Inflorescence racemose- to paniculate-corymbose*, 3–12(–25)-headed, *with straight, suberect branches* (more rarely with longer branches from the upper leaf-axils); peduncles slender, floccose. *Heads of medium size to rather large, \pm narrowed below*. *Phyllaries* incumbent in bud, *dark or blackish green*, linear-lanceolate (*attenuate from a broad base*), \pm obtusae, nearly effloccose, *with numerous dark glandular hairs*, epilose. Ligules glabrous-tipped. *Styles livid*. Margins of receptacle-pits setaceous-subulate-dentate. Achenes \pm dark purplish brown, 3.5–4 mm. long. Pappus rosy-tinted.

This plant has been repeatedly collected by Ley and others, and usually referred either to *H. corymbosum* Fr. or *H. salicifolium* Lindbg. Fries's name, as has been shown, is of doubtful application, and moreover a later homonym and therefore untenable. *H. salicifolium* Lindbg., whose features are well seen in Lindbg. H. Sc. Exs. no. 96, differs from the present plant by its narrower and more entire foliage, its elongate panicle and its glabrescent, eglandular phyllaries. As the plant now described cannot be otherwise identified, a new name becomes necessary, and *H. Bartonii* is chosen after our well-known batologist, Mr. W. C. Barton, who collected and distributed through the Botanical Exchange Club a fine series of specimens of this species, with useful notes, from Melte Glen in 1920.

H. Bartonii differs from *H. neocorymbosum* by its slenderer and more elegant habit, its thin, floccose foliage, its more compact panicle with slender, rigid peduncles, its more glandular phyllaries and its setaceous alveoles.

It is of frequent occurrence in the river valleys of Mid Wales, and seems fairly distributed in the north of England. No specimens have been noted from the Scottish Mainland.

A remarkable, slender plant with narrow, linear-lanceolate, toothed leaves, which was collected by Ley on the cliffs of Cwm Idwal, is probably an aberrant form of *H. Bartonii*.

Distribution.—42. Brecon : Melte Glen (Barton). Llanwrtyd ! Erwood (Hanbury). Abergwesyn, Torpantau and Hepste Glen (Ley). 44. Carmarthen : Llando-

very (Ley). 46. Cardigan: Lower Dothie Glen and Pont Rhyd-y-Groes (Ley). 48. Merioneth: Drwsynant (W. R. Linton). 49. Carnarvon: Llyn Dulyd (Ley). 64. M.W. Yorks: Ribbleshead! 65. N.W. Yorks: Hawes (T. A. Cotton). Sedburgh (F. A. Lees). 69. Westmorland: Grasmere (Fox). Colwith Bridge (W. R. Linton). Langdale (Crosfield). 103. Mid Ebudes: Coll (W. A. Clark).

Ireland.—20. Wicklow: Polonass (Barrington). Devil's Glen and Garryknock (Brunker). 39. Antrim: Glenarm (Lett and Waddell).

Endemic.

225. *HIERACIUM SUBPOLYPHYLLUM* Pugsley, nom. nov., in Journ. Ecol. xxxiii. 347 (1946).

H. polyphyllum Dahlstedt in Johnston, Add. Fl. Orkney, xvi. 5-7, in Trans. Bot. Soc. Edin., and in B.E.C. Report, x. pt. 1, 24 (1933); non Willd. Enum. hort. Berol. Suppl. 54 (1813).

Exsicc.—Johnston no. 4560.

Stem 30-90 cm. high, rather slender and flexuous, glabrescent or slightly pilose, becoming ± floccose above. Leaves 12-15(-30), dull green, paler beneath; lower oval to oblong, rounded-obtuse to subacute, subentire to remotely denticulate, attenuate below to ± short, winged petioles or subsessile; median elliptic- to rhombic-lanceolate, acute to acuminate, remotely denticulate or with few shallow teeth, sessile with broadly cuneate to rounded base; upper broadly ovate-lanceolate, acuminate, subentire or with scattered teeth or denticulations, sessile with broadly rounded base; all glabrescent above and floccose beneath, the lower also ± pilose, margins of the lower leaves ± ciliate, of the upper generally scaberulous. Inflorescence elongate-paniculate-corymbose, 3-10(-20)-headed, often with suberect, ± long branches from the upper leaf-axils; peduncles floccose, occasionally with a few solitary pilose hairs. Heads of medium size, rounded below. Phyllaries incumbent in bud, blackish green, broad, linear-lanceolate, obtuse, effloccose, with many dark glandular and a few longer pilose hairs, and numerous microglands. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits shortly dentate, the teeth fimbriate or setaceous-pointed. Achenes dark purplish brown, 3.5-4 mm. long. Pappus fulvous.

This species was described by Dahlstedt from specimens collected by Johnston on sea-cliffs at Hoxa Sound, Flotta, and at Hobbister, Orphir, Mainland, in the Orkneys. Dahlstedt remarked in his account that it was related to *H. salicifolium* Lindeberg. The plant, however, had been previously found at Hobbister by Syme in 1873, and by J. B. F. Fortescue in 1880, and there is a good series of their specimens, as well as cultivated examples, in Herb. Hanbury. Hanbury referred the plant to Lindeberg, who wrote '*H. salicifolium* verum. Vide Hartm. Sk. Fl. 1879. *H. corymbosum* v. *latifolium* H. Sc. Exs. no. 96'. Although so named by Lindeberg, this Orkney plant does not appear quite identical with *H. salicifolium*, and Dahlstedt seems to have shown greater accuracy in separating it as a new species, for its foliage is broader and less entire, and its phyllaries much broader with copious clothing.

Distribution.—111. Orkney: Hobbister (Syme). Flotta (Johnston).

Endemic.

Series **Stricta**. (See page 271.)

226. *HIERACIUM RETICULATUM* Lindeberg, Hier. Sc. Exs. iii. 147 (1878); Stenstr. Värml. Archier. 72 (1889); *H. strictum* var. *reticulatum* Hanb. in Bab. Man. ed. 9, 266 (1904); W. R. Lint. Brit. Hier. 86 (1905); *H. inuloides* subsp. *reticulatum* Zahn, l. c. 899 (1922).

Exsicc.—Lindbg. H. Sc. Exs. ii. 98 and iii. 147 ; Dahlst. H. Exs. iii. 93 ; Linton no. 98 (Tongue), and no. 121 (Roy Bridge) as *H. strictum* var. *amplidentatum* ; Marshall nos. 1197 and 1998, both in Hb. Hanbury ; Marshall nos. 2163 and 3873, both in Hb. Mus. Brit.

Stem (40–)60–120 cm. high, *robust*, reddish below, glabrescent or rarely slightly pilose between the median leaves. *Leaves* numerous (–40), often \pm crowded, *long*, *yellowish- or olive-green*, paler and strongly reticulate beneath ; lower obovate-lanceolate to linear-lanceolate, subacute, remotely denticulate to dentate, long-attenuate below, long-petiolate to sessile ; median *lingulate-lanceolate*, *long-acuminate*, with \pm distant, unequal, often *narrow or cusped teeth*, sometimes interspersed with denticulations, usually but slightly narrowed below to a sessile, \pm rounded base ; upper ovate-lanceolate, long-acuminate, with a few, often long and narrow teeth towards the sessile, broadly rounded base ; the *lower* generally \pm *pilose* on both surfaces, often with strongly ciliate margins, the *upper glabrescent* (or sometimes \pm floccose beneath) with margins scaberulous. *Inflorescence* *laxly paniculate-corymbose*, 4–20(–50)-headed, with long acladium and long, slender, erect-spreading branches, often with very long leafy ones from the upper leaf-axils forming a wide panicle ; peduncles \pm floccose, sometimes with scattered spreading, dark-based pilose hairs. *Heads* of *medium* size or rather large, \pm narrowed below. *Phyllaries* incumbent in bud, *blackish or dark olive-green*, the outer \pm lax, linear-lanceolate, obtuse, slightly floccose about the base or along the margins, and *microglandular*, with \pm numerous *unequal dark glandular and occasionally a few longer pilose hairs*. Ligules glabrous-tipped. *Styles* *yellow*. Margins of receptacle-pits subulate-dentate. Achenes dark purplish or blackish brown, about 4 mm. long.

β. melanoglochis (Lint.) comb. nov.

H. corymbosum var. *melanoglochis* Linton ap. W. R. Lint. Brit. Hier. 88 (1905).

Exsicc.—Linton, Bettyhill, 1888, in Hb. Mus. Brit. and Hb. Hanbury.

Leaves very sharply and irregularly toothed. Upper part of stem and inflorescence finely scaberulous as well as floccose, with \pm numerous dark glandular and pilose hairs. Phyllaries with few microglands. Otherwise like the type.

γ. reayense var. nov.

Exsicc.—Hanbury, Reay, 1887 (type), as *H. corymbosum* var. — ; Braemar, 1886 ; Dunbeath, 1887 ; all in Hb. Hanbury.

Folia dentibus vulgo quam in typo minoribus praedita. Anthela minus patula, ramis pedunculisque floccosis pilis basi obscuris patentibus \pm densis obsitis. Involucra magna, lata, squamis inferioribus appressis inferne rotundata.

Leaves with teeth usually smaller than in the type. Panicle less spreading, the branches and peduncles floccose, with \pm dense, dark-based, spreading pilose hairs. Heads large and broad, rounded below with appressed outer phyllaries.

δ. angustifolium var. nov.

Exsicc.—Hanbury, Altnaharra, 1887 (type), as *H. corymbosum* var. —, in Hb. Hanbury.

Folia quam typi multo angustiora ; inferiora mediaeque lineari-lanceolata, denticulata, summa tantum dentibus argutis inaequalibus munita. Anthela oligocephala, laxa, gracilis.

Leaves much narrower than in the type, the lower and median linear-lanceolate, denticulate ; the upper only with sharp, unequal teeth. Panicle few-headed, lax and slender.

H. reticulatum is readily separable from the preceding species by its long, narrow, sharply toothed leaves and its more ample panicle of flower-heads. Scottish specimens are usually more luxuriant, with somewhat larger heads, than Lindeberg's type *exsiccatae*, but they may reasonably be held conspecific.

There is little to distinguish the variety *melanoglochis* except its scaberulous inflorescence. Hanbury's herbarium contains fine series of var. *reayense*, which is a handsome plant, and of var. *angustifolium*. The latter somewhat resembles *H. strictum* Fr., as recently understood, but differs from the exsiccata Lindeberg *H. Sc. Exs. ii. 94*, by its more numerous and less toothed leaves, less strict and more spreading panicle, and yellow styles.

The specimen of *H. crocatum* var. *pyncnophyllum* Lindbg. in Herb. Hanbury from the Dochart, at Killin, is a form of *H. reticulatum*, which grows at that station in company with *H. latobrigorum*. Lindeberg's plant (*H. Sc. Exs. iii. 149*) is a slender, more glabrous form, with large, dark heads and microglandular phyllaries, that probably does not occur in Britain.

Distribution.—42. Brecon: Torpantau (Ley). 72. Dumfries: Moffat (Linton). 85. Fife: St. Andrews (Bailey). 87. W. Perth: Dollar (Drummond). Linn of Campsie (Linton). 88. Mid Perth: Killin! Crianlarich (Hanbury). Strath Braan (Buchanan-White). 89. E. Perth: Blairgowrie! Dunkeld! 90. Forfar: Glen Esk and Monifieth (Corstorphine). 91. Kincardine: Banchory Ternan (Trail). 92. S. Aberdeen: Braemar! Aberdeen Old Links (—). 95. Elgin: Speyside (Druce). 96. E. Inverness: Inverness (Groves). Loch Ness (Townsend). Nairn (Marshall). 97. W. Inverness: Roy Bridge! 98. Argyll: Inveroran (Marshall). 105. W. Ross: Kinlochewe (Druce). 106. E. Ross: Rogie Falls (M. M.). 107. E. Sutherland: Oykel Bridge (Hanbury). 108. W. Sutherland: Tongue (Marshall). 109. Caithness: Lybster (Hanbury). Reay and Thurso (Miss Todd).

var. *melanoglochis*.

108. W. Sutherland: Bettyhill (Linton).

var. *reayense*.

92. S. Aberdeen: Braemar (Backhouse). 106. E. Ross: Conan River (Marshall). 108. W. Sutherland: Farr (W. F. Miller). Tongue (Hanbury). 109. Caithness: Reay, Dunbeath and Lybster (Hanbury).

var. *angustifolium*.

108. W. Sutherland: Altnaharra (Hanbury).

General Distribution.—Scandinavia.

227. *HIERACIUM STRICTIFORME* (Zahn) Roffey in Lond. Cat. ed. II (1925).

H. inuloides subsp. *strictiforme* Zahn, l. c. 906 (1922); *H. strictum* Backh. Mon. 71 (1856); Hanb. in Bab. Man. ed. 9, 265 (1904); W. R. Lint. Brit. Hier. 85 (1905); non Fries, Symb. 164 (1848).

Icon. Pl. 13, fig. b.

Exsicc.—Linton no. 73 (Inverey), as *H. strictum*, and no. 158 (Tongue), as *H. strictum* var. *opsianthum*; Hanbury, Inverey and Altnaharra, 1887; all in Hb. Hanbury.

Stem (30–)50–90 cm. high, *robust*, reddish below, glabrescent or sparingly pilose above the base, slightly floccose towards the inflorescence. *Leaves* 15–25(–30), *deep green*, paler and reticulate beneath; lower obovate-lanceolate to oblanceolate, obtuse-mucronulate to acute, subentire or obscurely denticulate, long-attenuate below to \pm short, winged petioles, median *lingulate-* or *oblong-lanceolate*, *acute* to acuminate, *subentire* or with distant, spreading denticulations, slightly narrowed below to a *broad, rounded*, sessile base; upper ovate-lanceolate, acuminate, with a few fine teeth towards the broad, rounded, sessile base, or subentire; the *lower pilose* on both surfaces, especially beneath, *median and upper becoming glabrescent*, or sometimes with the lower surface floccose; margins of the lower leaves ciliate (often strongly), of the upper generally scaberulous. *Inflorescence paniculate-corymbose*, (2–)6–12(–30)-headed, *compact* or with some \pm long, *suberect* or *erect*.

spreading branches from the upper leaf-axils; peduncles floccose, with sometimes some scattered, spreading pilose hairs. *Heads* \pm large, truncate-based. *Phyllaries* incumbent in bud, dark olive-green, rather broad, linear-lanceolate, obtuse, scarcely floccose, with dense, long and short, dark glandular hairs and longer, dark-based pilose hairs (few or many) and microglands intermixed. *Ligules* glabrous- or the inner sparingly pilose-tipped. *Styles* livid. Margins of receptacle-pits subulate-dentate, \pm fimbriate. Achenes blackish brown, about 3.5 mm. long.

This plant, which has been generally regarded by British authors as *H. strictum* Fr., is distinguished as a separate endemic Scottish subspecies by Zahn (l. c.), who cites one station only, Inverey, near Braemar. It is in reality widely spread over the Scottish Highlands. *H. strictum* Fr. is shown by Zahn as another subspecies *strictum* of the same superspecies, occurring in Norway, Sweden, Shetland and Skye; he does not seem to have seen any Scottish specimens. His conception of *H. strictum* is founded on Lindeberg's, which is shown by the exsiccata H. Sc. Exs. ii. 94 to be a plant with long, linear-lanceolate, irregularly toothed leaves and few large, truncate-based heads. No British specimens have been observed which match those of Lindeberg. The name *H. strictum* Fr. is now invalid to represent a species, being a later homonym of *H. strictum* Ledebour, Fl. Altaica, ix. 132 (1833), and it is therefore proposed to substitute ***H. secundistrictum*** nom. nov. in this sense.

H. strictiforme differs essentially from the foregoing species of this group, excepting *H. reticulatum*, by its narrower, more lingulate and generally less toothed foliage, and by its larger flower-heads. *H. reticulatum* is readily separable by the relatively long and narrow teeth of its leaves and its yellow styles.

Distribution.—47. Montgomery: Rhaiadr (Ley). 65. N.W. Yorks: Sedbergh (Wilson). 68. Cheviotland: Henhole (Brotherston). 75. Ayr: Largs (Boyd). 79. Selkirk: Cadden-foot (Brotherston). 87. W. Perth: Linn of Campsie (Buchanan-White). 88. Mid Perth: Strath Braan (Buchanan-White). Glen Lochay (Marshall). Lawers (Marshall). Crianlarich (Hanbury). 90. Forfar: Glen Isla (Corstorphine). 91. Kincardine: Banchory Ternan (Trail). 92. S. Aberdeen: Braemar! Inverey (Hanbury). 95. Elgin: Dumphail (Marshall). 97. W. Inverness: Foyers (Townsend). Coire Coille (Marshall). Inverloch (Borrer). Bridge of Roy! 98. Argyll: Buchaille Etive More and Dalmally (Marshall). 104. N. Ebeudes: Uig, Skye (Linton). 107. E. Sutherland: Brora (Marshall). 108. W. Sutherland: Bettyhill and Altnaharra (Hanbury). Tongue (Marshall). 109. Caithness: Thurso (Hanbury). 110. Outer Hebrides: Ben Eaval, N. Uist (Shoolbred). Scarp (Duncan).

Ireland.—20. Wicklow: Devil's Glen (Vowell). Thonlegee (Brunker). 31. Louth: Carlingford (Hart). 38. Down: Pigeon Rock, Mourne Mts. (Praeger). Tollymore Park (Hart). 39. Antrim: Ballycamon Glen (Corry). Cave Hill (Stewart). 40. Derry: Dungiven (Hart).

Endemic.

228. **HIERACIUM OPSIANTHUM** (Dahlstedt) Roffey in Lond. Cat. ed. 11 (1925).

H. strictum var. *opsianthum* Dahlst. H. Exs. i. 100 (1899); Hanb. in Bab. Man. ed. 9, 266 (1904); W. R. Lint. Brit. Hier. 85 (1905); *H. lycopifolium* var. *norvegicum* Lindbg. H. Sc. Exs. ii. 93 (1872); *H. inuloides* subsp. *opsianthum* Zahn, l. c. 901 (1922).

Exsicc.—Lindbg. H. Sc. Exs. ii. 93; Dahlst. H. Exs. i. 100; Linton no. 158 (Glen Roy); Marshall nos. 1754 and 2034; Shoolbred no. 333; all in Hb. Mus. Brit.

Stem 40–90 cm. high, *robust*, reddish about the base, pilose (sometimes strongly) or glabrescent, becoming \pm floccose upwards. *Leaves* 15–30(–40), often closely set, deep green, paler and reticulate beneath; lower obovate to obovate-lanceolate,

rounded-obtuse-mucronulate to acute, remotely denticulate with sometimes one or two larger teeth, attenuate below to \pm short, winged petioles; median *elliptic-lanceolate* to ovate-lanceolate, *acute* to acuminate, with \pm distant, *unequal, sharp* but often shallow teeth, attenuate or abruptly narrowed to a sessile, \pm broadly rounded base; upper ovate-lanceolate, \pm long-acuminate, generally with a few sharp teeth in the lower half, sessile with broadly rounded or subcordate base; all *pilose* beneath, the lower also on the upper surface, *upper often \pm floccose* on both sides; margins \pm ciliate. *Inflorescence paniculate-corymbose*, (2-)8-15(-25)-headed, with short acladium, and generally *short or long, erect-spreading branches* from the upper leaf-axils; peduncles floccose, often with \pm numerous, spreading pilose hairs. *Heads large and broad, truncate-based*. *Phyllaries* incumbent in bud, *blackish green, broad*, linear-lanceolate, obtuse, sparingly floccose, *with many long, dark-based pilose hairs*, intermixed with *unequal glandular hairs and microglands*. Ligules glabrous-tipped (often stylose). *Styles livid*. Margins of receptacle-pits \pm shortly dentate. Achenes dark purplish or blackish brown, about 4 mm. long.

H. opsianthum is typically distinct in its rather broad, deep green, sharply cut foliage, and very broad, large, dark heads, with much pilose hair on the broad phyllaries. Some British forms agree closely with the original Scandinavian specimens, but others, especially some of those growing about Glen Spean, in Inverness-shire, have rather longer and less toothed leaves, and less broad and pilose heads. It is not certain whether some of these might not be better regarded as forms of *H. strictiforme*. There is a specimen in Herb. Mus. Brit. with denticulate foliage (J. H. Martin, Pepper Wood, Linlithgow, 1915) that is probably an unusual form of *H. opsianthum*.

Distribution.—88. Mid Perth: Crianlarich (Marshall). 89. E. Perth: Dunkeld! 90. Forfar: Clova (Linton). 91. Kincardine: Banchory (Riddelsdell). 92. S. Aberdeen: Braemar (Gardiner and Riddelsdell). 96. E. Inverness: Beaully (Druce). Kingussie (Marshall). 97. W. Inverness: Glen Spean and Glen Roy! 106. E. Ross: Garve and Conan River (Marshall). Strathpeffer (Miss Todd). 108. W. Sutherland: Lochinver (Hanbury). Tongue (Marshall). 110. Outer Hebrides: L. Skipport, S. Uist (R. B. Cooke). Scarp (Duncan).

Ireland.—34. E. Donegal: Innishowen (Hart). 35. W. Donegal: Errigal (Knwles). 38. Down: Tollymore Park (Stewart and Praeger). 39. Antrim: Cave Hill (Stewart). Garron Point! Glen Dun (Shoolbred).

General Distribution.—Norway.

229. HIERACIUM LISTERAE sp. nov.

Exsicc.—Hanbury, Auchallater, 1887 (type); Linton no. 123 (Braemar); both in Hb. Hanbury; Backhouse, Braemar, 1852, in Hb. Backhouse; all as *H. crocatum*.

Caulis 30-90 cm., *robustus*, ubique sparsim pilosus sed ad basin saepe glaber, anthelam versus leviter floccosus. *Folia* 15-25, *laete vel luteo-viridia*, inferne pallidiora, \pm suberecta; inferiora lineari-oblonga, obtuso-mucronulata ad subacuta, subintegra ad remote denticulata, inferne ad petiolum brevem alatum longe attenuata; media *lineari-oblonga, acuta, denticulata* ad tenuiter et irregulariter dentata, *in basin sessilem rotundatam abrupte angustata*; summa lanceolata ad ovato-lanceolata, acuminata, basin sessilem rotundatam versus \pm dentata; omnia utrinque *breviter pilosa* vel superiora supra glabrescentia, marginibus ciliatis vel foliorum superiorum scaberulis. *Anthela paniculato-corymbosa*, (3-)6-12(-25)-cephala, acladio normaliter brevi et ramis erecto-patulis saepe longis e foliorum summorum axillis praedita; pedunculis parce floccosis, interdum pilis sparsis patentibus vestitis. *Involucra magna, basi truncata*. *Squamae atrovirides* (interiores saepe pallidiores), *latae*, lineari-lanceolatae, obtusae, circa basin sparsissime floccosae microglandulosae, *glandulis multis tenuibus obscuris inaequalibus et saepe pilis longioribus basi atris vestitae*. Ligulae apice glabrae. *Styli lividi*. Receptaculi alveoli margine subulato-dentati.

Stem 30–90 cm. high, *robust*, with scattered pilose hairs throughout (often glabrous about the base), slightly floccose towards the inflorescence. *Leaves* 15–25, *bright or yellowish green*, paler beneath, \pm suberect; lower linear-oblong, obtuse-mucronulate to subacute, subentire to remotely denticulate, long-attenuate below to short, winged petioles; median *linear-oblong, acute, denticulate* to finely and irregularly dentate, *shortly narrowed below to a sessile, rounded base*; upper lanceolate to ovate-lanceolate, acuminate, \pm dentate towards the sessile, rounded base; all *shortly pilose* on both surfaces or the upper glabrescent above, margins ciliate or those of the upper leaves scaberulous. *Inflorescence paniculate-corymbose*, (3)6–12(–25)-headed, *with* normally short acladium and *erect-spreading branches*, often long lower ones from the axils of the upper stem-leaves; peduncles sparsely floccose, sometimes with scattered, spreading pilose hairs. *Heads large, truncate-based. Phyllaries* incumbent in bud, *blackish green* (the inner often paler), *broad*, linear-lanceolate, obtuse, very sparingly floccose and microglandular about the base, *with many fine, unequal, dark glandular and often longer, dark-based pilose hairs*. Ligules glabrous-tipped. *Styles livid*. Margins of receptacle-pits subulate-dentate. Achenes blackish brown, about 3.5 mm. long.

This plant differs considerably from typical *H. crocatum* Fr., of Herjedalen, in Sweden, as represented in the exsiccatae Fries Hier. Eur. 142, Lindeberg H. Sc. Exs. i. 46 and 49, and Dahlstedt H. Sc. xxi. 97 and 98. These exsiccatae, which are homogeneous, show a handsome hawkweed, of rather slender habit, with bright green little toothed foliage, the upper leaves conspicuously acuminate and subcordate-based, and very black heads with remarkably broad, lanceolate, subacute phyllaries. The specimens may be regarded as the *H. crocatum* of which Fries, in the *Épicrisis* (p. 125), writes ‘Species nobilissima, distinctissima, insigne Florae Arcticae decus’. Zahn (l. c. 922) describes a similar plant (as *H. aestivum* subsp. *crocatum* (Fr.)) without citing the Scandinavian exsiccatae, and includes “N. Ireland. Shetland! N. England! Scotland (Lint. no. 123!)” among its habitats. No British examples, however, of this restricted *H. crocatum* Fr. have been seen. The Irish specimens so labelled are *H. opsianthum*, the Shetland and Teesdale plants quite different forms, and the Scottish example cited the present species *H. Listerae*, which is a coarser and more hirsute plant, with a wider panicle of rather larger heads quite lacking the characteristic very broad, black phyllaries.

H. Listerae is closely allied to *H. strictiforme* and *H. opsianthum*. It differs from the former in its light green, less reticulate and finely dentate foliage, while the latter is to be distinguished by its broader and darker green leaves and broader flower-heads. *H. Listerae* is at present known only from the neighbourhood of Braemar, where it seems to have been first collected by Backhouse. There is a fine set of specimens in Herb. Hanbury. The plant is dedicated to Miss Gulielma Lister, whose beautiful water-colour drawings of *Hieracia* were utilized for the plates in Hanbury’s Monograph. Specimens of *H. Listerae*, now in my possession, were sent her for drawing in 1887 from the *locus classicus* near Braemar.

Distribution.—92. S. Aberdeen : Braemar (Backhouse).

Endemic.

Series **Angusta**. (See page 272.)

230. *HIERACIUM PSEUDAMPLIDENTATUM* sp. nov.

H. strictum var. *amplidentatum* Hanb. in Journ. Bot. xxxii. 232 (1894); in Bab. Man. ed. 9, 266 (1904); W. R. Lint. Brit. Hier. 86 (1905), pro parte; *H. inuloides* subsp. *tridentatifolium* var. *amplidentatum* Zahn, l. c. 904 (1922), pro parte; *H. corymbosum* var. *umbellatiforme* W. R. Lint. Brit. Hier. 88 (1905), pro parte; *H. aestivum* subsp. *subumbellatiforme* Zahn, l. c. 919 (1922), pro parte.

Exsicc.—Buchanan-White, River Lyon, 1890 (type); Marshall no. 1196; Linton no. 157, as *H. strictum* var. *angustum*; all in Hb. Hanbury; Marshall nos. 2165, 2868, 3533 and 3638, all in Hb. Mus. Brit.

Caulis 30–100 cm., \pm robustus, inferne rubescens et glaber, e medio sursum glabrescens, pilosus vel leviter scaberulus. Folia 20–25(–40), \pm longa angustaque, pallide viridia; inferiora saepe longissima, lineari-oblonga, obtuso-mucronulata, subintegra vel obsolete denticulata, in petiolum longum brevemve alatum attenuata; media patentia, nonnunquam conferta, lanceolata, acuta ad acuminata, remote denticulata ad leviter dentata, in basin sessilem, rotundatum, semi-amplexicaulem \pm attenuata; superiora lanceolata ad ovato-lanceolata, acuminata, basin sessilem semi-amplexicaulem versus parce sinuato-dentata vel subintegra; omnia floccosa (praesertim in paginâ inferiore), inferiora etiam \pm pilosa; superiorum marginibus tenuiter scaberulis inferiorum scaberulis vel molliter ciliatis. Anthela paniculato-corymbosa, (2–)6–12(–20)-cephala, ramis gracilibus erecto-patulis, rarius e foliorum superiorum axillis nonnullis emissis; pedunculi sparsim floccosi. Involucra mediocria ad majuscula, basi rotundata. Squamae obscure olivaceae (interiores saepius pallidiores), lineari-oblongae, obtusae, floccis sparsis glandulisque obscuris inaequalibus in lineâ mediâ obsitae, epilosae. Ligulae apice glabrae. Styli lutei. Receptaculi alveoli margine breviter dentati, \pm fimbriati.

Stem 30–100 cm. high, \pm robust, reddish and glabrous below, glabrescent, pilose or slightly scaberulous from the middle upwards. Leaves 20–25(–40), \pm long and narrow, pale green; the lower often very long, linear-oblong, obtuse-mucronulate, subentire or obscurely denticulate, attenuate below to long or short, winged petioles; median spreading, sometimes crowded, lanceolate, acute to acuminate, remotely denticulate to shallowly dentate, \pm attenuate below to a sessile, rounded, semi-amplexicaul base; upper lanceolate to ovate-lanceolate, acuminate, sparingly sinuate-dentate towards the sessile, semi-amplexicaul base or subentire; all floccose, chiefly on the lower surface, the lower also \pm pilose; margins of the upper finely scaberulous, of the lower scaberulous or softly ciliate. Inflorescence paniculate-corymbose, (2–)6–12(–20)-headed, with slender, erect-spreading branches, some occasionally from the upper leaf-axils; peduncles sparingly floccose. Heads of medium size to rather large, rounded below. Phyllaries incumbent in bud, dark olive-green (the inner generally paler), linear-oblong, obtuse, with scattered floccum and unequal, dark glandular hairs in a median line, epilose. Ligules glabrous-tipped. Styles yellow. Margins of receptacle-pits shortly dentate, \pm fimbriate. Achenes dark purplish brown, about 4 mm. long.

β. stenophyllum var. nov.

H. strictum var. *angustum* W. R. Lint. Brit. Hier. 86 (1905); *H. aestivum* subsp. *angustum* Zahn, l. c. 925 (1922); non *H. angustum* Lindbg. Hier. Sc. Exs. iii. 148 (1878).

Exsicc.—Linton no. 122 (Roy Bridge) (type), as *H. corymbosum* var. *salicifolium*; Marshall no. 2016; both in Hb. Mus. Brit. and Hb. Hanbury.

Folia media longa, lineari-oblonga ad anguste lanceolata, acuta; summa ovato-lanceolata, acuminata; omnia remote vel obscure denticulata.

Median leaves long, linear-oblong to narrowly lanceolate, acute; upper ovate-lanceolate, acuminate; all remotely or obscurely denticulate. Otherwise like the type.

This plant was imperfectly described by Hanbury, but specimens from the stations that he mentions in the description are present in his herbarium, and are both homogeneous and in accord with his written account so far as it goes. The herbarium includes a fine set of examples from the Crook of Devon, transferred from the Boswell-Syme collection. From these exsiccatae it may be seen that *H. strictum* var. *amplidentatum* Hanb. is a distinct plant, characterized by long, rather narrow, semi-amplexicaul and floccose leaves, which are not 'amplidentate' but quite shortly

toothed, and by yellow-styled flower-heads with relatively narrow, pale and little clad phyllaries. W. R. Linton seems to have been misled by Hanbury's varietal epithet, for he writes (l. c.) 'leaves often with large teeth', and says it is closely connected with var. *reticulatum*. Indeed, Linton's set no. 121 from Roy Bridge, sent out as var. *amplidentatum*, is excellent *H. reticulatum*. Zahn, on the other hand, identifies var. *amplidentatum* with W. R. Linton's *H. corymbosum* var. *salicifolium*, as represented by Linton's set no. 122.

The majority of the British herbarium specimens of this affinity, however, have been identified not with var. *amplidentatum* but with *H. angustum* Lindbg., and this identification has commonly been accepted by Zahn. Lindeberg's species is well represented in his exsiccata Hier. Sc. Exs. iii. 148, and by other Scandinavian sheets in Herb. Hanbury, including Dahlstedt H. Exs. iii. 95. There are three further sets in Herb. Kew, viz. :—Dahlst. H. Sc. v. 100, ix. 97 and ix. 98. All of these exsiccatae seem homogeneous, and although they closely resemble some of the narrow-leaved British specimens, I do not think them specifically identical, for their leaves, on an average, are distinctly narrower and parallel-sided rather than lanceolate, and their phyllaries are darker and more concolorous, less floccose and almost eglandular. The British narrow-leaved specimens look different in foliage from typical var. *amplidentatum*, but their flower-heads are exactly similar, and the ample material in Herb. Hanbury shows such a complete gradation to the broader-leaved form that they cannot be treated as a different species and it is not easy even to decide just where to separate them as a variety. There is, furthermore, authentic material of *H. corymbosum* var. *umbellatiforme* W. R. Lint. in Herb. Mus. Brit., collected by Linton himself, which appears to be only another somewhat narrow-leaved, intermediate form of var. *amplidentatum*.

It thus appears that there is a group of forms in Britain, allied to *H. strictum* var. *amplidentatum* Hanb. and to *H. angustum* Lindbg., which show little variation except in foliage and appear conspecific. They cannot be satisfactorily separated from Hanbury's variety *amplidentatum*, when his authentic material is examined, but the name has been diversely understood by W. R. Linton and by Zahn, and may be regarded as a *nomen ambiguum*. It is therefore deemed best to deal with the group of forms as a new species under a fresh name *H. pseudamplidentatum*.

Distribution.—42. Brecon : Cwm Taffechan (Ley). 85. Kinross : Crook of Devon (Syme). 87. W. Perth : Glen Devon (Syme). Linn of Campsie (Linton). 88. Mid Perth : River Lyon and Lochearnhead (Buchanan-White). Glenartney (Melvill). Glen Lochay ! Lawers (Marshall). 89. E. Perth : Pitlochry (Lousley). Glen Shee (Linton). 96. E. Inverness : Kingussie and Bridge of Brown (Marshall). Speyside (Druce). Kincairdie (Somerville). 97. W. Inverness : Roy Bridge (Marshall). 98. Argyll : Dalmally (Marshall).

var. *stenophyllum*.

88. Mid Perth : Glenartney (Melvill). Strath Braan (Buchanan-White). Forthingal (Miss D. Powell). Glen Lochay ! 90. Forfar : Linwathen (Corstorphine). 95. Elgin : Dumphail (Marshall). 97. W. Inverness : Roy Bridge !

Endemic.

231. HIERACIUM BAKERANUM sp. nov.

Exsicc.—Wheldon, Winch Bridge, 1889 (type), as *H. strictum* var. *angustum*, in Hb. Hanbury ; D. Oliver, Winch Bridge, as *H. crocatum*, in Hb. Backhouse.

Caulis 50–90 cm., *gracilis*, inferne rubescens, glabrescens vel basin versus pilis sparsis patulis vestitus, superne nonnunquam \pm scaberulus. *Folia* (15–)20–30–40), *longa, angusta, dilute vel luteo-viridia* ; inferiora lineari-oblonga (interdum longissima), obtusa ad acuta, subintegra, inferne in petiolum brevem alatum longe attenuata ; media *lineari-oblonga ad lineari-lanceolata*, acuta ad acuminata, remote *irregulariter*

(nonnunquam 1–2 dentibus majoribus) *denticulata*, inferne in basin sessilem rotundatam contracta, summa sensim minora, lanceolata vel lineari-lanceolata, inferne parce dentata, basi latiore rotundatâ sessilia; omnia utrinque molliter pilosa vel saepe sursum glabrescentia, marginibus inferiorum breviter ciliatis superiorum \pm scaberulis. *Anthela paniculato-corymbosa*, *elongata*, (3–)5–10(–12)-cephala, ramis gracilibus suberectis acladium superantibus, et saepe e foliorum superiorum axillis ramis inferioribus; pedunculis floccosis. *Involucra mediocria* ad satis parva, inferne *angustata*. *Squamae atrovirides*, haud numerosae, lineari-lanceolatae (e basi latâ attenuatae), obtusae, effloccosae, *glandulis tenuibus obscuris numerosis microglandulisque immixtis vestitae*, vulgo *epilosae*. *Ligulae* apice glabrae. *Styli lutei*. *Alveoli receptaculi* margine argute dentati.

Stem 50–90 cm. high, slender, reddish below, glabrescent or with scattered, spreading pilose hairs towards the base, sometimes \pm scaberulous above. *Leaves* (15–)20–30(–40), long and narrow, light or yellowish green; lower linear-oblong, sometimes very long, obtuse to acute, subentire, long-attenuate below to \pm short, winged petioles; median linear-oblong to linear-lanceolate, acute to acuminate, remotely and irregularly denticulate with sometimes 1–2 larger teeth, \pm contracted below to a rounded, sessile base; upper decreasing, lanceolate or linear-lanceolate, sparsely toothed below, sessile with a broader, rounded base; all softly pilose on both surfaces but often becoming glabrescent upwards, margins of the lower shortly ciliate, of the upper \pm scaberulous. *Inflorescence* paniculate-corymbose, elongate, (3–)5–10(–12)-headed, with slender, suberect branches exceeding the acladium, and often lower ones from the upper leaf-axils; peduncles floccose. *Heads* of moderate size or rather small, narrowed below. *Phyllaries* incumbent in bud, blackish green, rather few, linear-lanceolate (attenuate from a broad base), obtuse, effloccose, with numerous fine, dark glandular hairs and some microglands, generally epilose. *Ligules* glabrous-tipped. *Styles* yellow. *Margins* of receptacle-pits sharply dentate. *Achenes* dark purplish brown, about 4 mm. long.

This plant has long been known from the neighbourhood of Winch Bridge, in Upper Teesdale, and was collected by Backhouse, Baker and others as *H. crocatum* Fr. More recently it has been confused with *H. angustum* Lindbg. Its tall growth, hirsute leaves, and small heads with broad but attenuate phyllaries readily separate it from *H. crocatum*, which, as already pointed out, is not a British plant. And its more or less hirsute foliage, and relatively broad and dark phyllaries, serve to distinguish it from *H. angustum*. It is not unlike the Norwegian *H. praelongum* Lindbg. (Hier. Sc. Exs. i. 42), but this has leaves sharply serrate in the lower half, and smaller heads, much more strongly glandular. As a new species it is dedicated to J. G. Baker, who was familiar with the hawkweeds of Teesdale and interested in the genus *Hieracium* to the end of his long life.

There is a plant in Herb. Hanbury, collected by Buchanan-White in 1891 at Lochearnhead and named '*H. crocatum* * *trichophyton* Alm. n. var. *glandulis longis*' by Elfstrand, which somewhat resembles *H. Bakerianum* in its numerous narrow leaves, and lax, elongate panicle of dark heads with yellow styles. It seems to differ essentially, however, in its leaves being shorter and more regularly denticulate, and its heads rather larger with much more strongly glandular phyllaries. It is clearly not conspecific with the subspecies *trichophyton* Alm. as described by Zahn (l. c. 923), which has subentire leaves, and few black heads with very broad phyllaries and black styles. This plant, which merits further investigation, is shown as a variety *trichophyton* of *H. crocatum* Fr. (f. *glandulosa* Hanb.) by W. R. Linton (Brit. Hier. 90).

Distribution.—65. N.W. Yorks: Winch Bridge (Backhouse)! (Also 66. Durham?).

Endemic.

232. *HIERACIUM TAVENSE* Ley in Journ. Bot. xlvii. 54 (1909).

H. rigidum var. *tavense* Ley ex W. R. Lint. Brit. Hier. 83 (1905); *H. laevigatum* subsp. *tavense* Zahn, l. c. 893 (1922).

Exsicc.—Ley, Tawe Valley, 1899, in Hb. Mus. Brit.

Stem 50–90 cm. high, rather *slender*, slightly pilose or glabrescent. *Leaves* 15–30, *dull green*, paler and reticulate-veined beneath; lower elliptic-lanceolate to lanceolate, acute, remotely denticulate or with a few small, unequal teeth, attenuate below to long or short, winged petioles; median *lanceolate*, acute to acuminate, remotely and irregularly *denticulate-dentate*, slightly *contracted* below to a *sessile, rounded base*; upper (gradually smaller and narrower) acuminate, subentire or with a few small teeth towards the broader, sessile base; all *glabrescent above*, \pm pilose and the upper also slightly floccose beneath; margins scarcely ciliate or scaberulous. *Inflorescence* *racemose-corymbose*, 3–9-headed, with rather long aeladium and slender, suberect branches; peduncles floccose with a few solitary, dark glandular hairs. *Heads small, subtruncate-based*. *Phyllaries* incumbent in bud, *dark olive-green* (inner with paler margins), linear-oblong, obtuse, subfloccose about the base, with \pm *dense, fine glandular hairs*, chiefly below and along the median line, *epilose*. Ligules glabrous-tipped. *Styles yellow*. [Apical pits and achenes not seen.]

This very distinct hawkweed was discovered by Ley in 1899 in the Upper Tawe valley above Cellwen, in Brecon, and was sent, unnamed, to the Botanical Exchange Club (B. I.). Cultivated examples were again sent to the Club in 1903 as *H. protractum* Fr., but Hanbury remarked on these that their general appearance was that of a form of *H. rigidum* Hartm. W. R. Linton accordingly described the plant (l. c.) as a variety of *H. rigidum*, which was corrected by Ley, as shown above.

H. tavense, in spite of the small, racemose panicle of the available specimens, seems clearly to belong to the group *Foliosa* rather than the *Tridentata*. Ley, in raising it to specific rank, compares it with *H. auratum* (*H. latobrigorum*), pointing out that it differs by its slenderer growth, more numerous and narrower leaves, and smaller heads without pilose hairs or microglands. The plant does not seem to have been again collected.

Distribution.—42. Brecon: Upper Tawe valley (Ley).

Endemic.

233. *HIERACIUM PYCNOTRICHUM* (Dahlstedt) Roffey in Lond. Cat. ed. 11 (1925).

H. pycnotrichum Dahlst. Hier. Sc. iv. 90 (1893) (nomen solum); *H. corymbosum* var. *pycnotrichum* W. R. Lint. Brit. Hier. 88 (1905); *H. inuloides* subsp. *pycnotrichum* Zahn, l. c. 902 (1922).

Exsicc.—Dahlst. H. Sc. iv. 90, in Hb. Kew; Cotton, Hawes, 1889, in Hb. Hanbury.

Stem 40–70 cm. high, *robust*, leafy, pilose except about the reddish base. *Leaves* 15–30(–40), \pm crowded, *pale green*; lower linear-oblong, subacute, attenuate below, subpetiolate; median *linear-oblong* to lanceolate, subacute to acute, scarcely *narrowed below* to \pm *rounded, sessile base*; upper lanceolate, acuminate, with broad, rounded, sessile base; all *subentire* or obscurely denticulate, *shortly pilose* on both surfaces or glabrescent above, with ciliate margins. *Inflorescence* *compactly racemose-corymbose* in examples seen, 2–7-headed, shortly branched with slender branches subequalling the aeladium; peduncles floccose with some spreading pilose hairs. *Heads of medium size* or rather small, *truncate-based*. *Phyllaries* incumbent in bud, *dull olive-green*, linear-oblong, obtuse, efloccose, with *numerous microglands* and some *dark glandular hairs*, *epilose*. Ligules glabrous-tipped. *Styles livid*. Margins of receptacle-pits incise-dentate. Achenes blackish brown, about 3.5 mm. long.

This plant was first identified as British by Elfstrand from specimens collected in 1888 and 1889 near the Gayle Beck, at Hawes, Yorkshire, by J. Percival and

T. A. Cotton. So far as can be judged from the rather poor sheet at Kew, they closely resemble Dahlstedt's species, which is chiefly characterized by its numerous narrow, sessile and subentire leaves, and its relatively small but truncate-based heads with obtuse, microglandular phyllaries and dark styles. Another British example in Herb. Hanbury, found by the Wear at Bishop Auckland, has likewise been referred to *H. pycnotrichum*, but although its flower-heads and the colour of its foliage are very similar to those of the Hawes plant, yet the form of its lanceolate leaves, which are all clearly narrowed at the base, seems essentially different. Hanbury's specimen is a good one, but further material of the species is desirable before it can be satisfactorily determined. In 1926 I obtained another allied plant above Aira Force, in Cumberland, with a large panicle of densely pilose and sparingly glandular heads. More material of this is also necessary before it can be accurately diagnosed.

There is a further remarkable plant in Herb. Hanbury, gathered by Linton at Braemar in 1883 and subsequently referred to *H. trichocaulon* Dahlst. It is of tall growth, with glabrous stem and more than twenty lanceolate, deeply toothed leaves, and bears a small panicle of dark, pilose heads. In general facies it resembles the Bishop Auckland plant except for its sharply dentate foliage.

Distribution.—65. N.W. Yorks : Hawes (Percival).

General Distribution.—Scandinavia.

Series **Maritima**. (See page 272.)

234. *HIERACIUM MARITIMUM* F. J. Hanbury in Bab. Man. ed. 9, 267 (1904) ; W. R. Lint. Brit. Hier. 90 (1905) ; *H. crocatum* var. *maritimum* Hanb. in Journ. Bot. xxvii. 76 (1889) ; *H. umbellatum* subsp. *maritimum* Zahn, l. c. 916 (1922) ; *H. inuloides* subsp. *strictum* f. *angustifolia* Dahlst. in Johnston, Add. Fl. Orkney, xii. 8, in Trans. Bot. Soc. Edin. (1929).

Exsicc.—Hanbury, Melvich, 1887, in Hb. Hanbury ; Johnston no. 4258.

Stem 30–70 cm. high, *robust*, ± reddish, pilose, becoming densely floccose and *asperous-scaberulous* above. Leaves 15–25, crowded, *suberect*, dark green, thick and rather fleshy ; lower ligulate or linear-oblong, obtuse to subacute, subentire, attenuate below but scarcely petiolate ; median subacute, *ligulate* or narrowly linear-oblong, subentire or with solitary obscure denticulations, sessile with shortly contracted and slightly rounded base ; upper gradually smaller, similar but a little dilated above the rounded base ; all *glabrous* above, asperous beneath or shortly pilose along the midrib, margins *asperous-scaberulous*. Inflorescence *paniculate-corymbose*, 3–12(–20)-headed, with erect-spreading, generally asperous branches, and sometimes longer lower ones from the upper leaf-axils ; *peduncles* densely floccose and asperous, sometimes also with solitary spreading pilose hairs. Heads large and broad, truncate-based. Phyllaries incumbent in bud, blackish green, very broad, lanceolate, obtuse, very sparingly floccose, with a few solitary dark glandular hairs, epilose. Ligules glabrous-tipped. Styles orange. Margins of receptacle-pits elevated, sharply dentate. Achenes blackish brown, 3.5–4 mm. long.

β. *pauciceps* var. nov.

H. umbellatum var. *pauciflorum* W. R. Lint. Brit. Hier. 92 (1904), ex parte ; non Hartm. Scand. Fl. ed. 5, 26 (1849).

Exsicc.—Hanbury, Carrick River, 1891 (type), as *H. umbellatum* var. *monticola* ; Hanbury, Inveroran, 1889, as *H. umbellatum* var. *pauciflorum* ; both in Hb. Hanbury.

Caulis (20–)30–50(–70) cm., pilosus vel glabrescens, sursum quam in typo minus scaberulus. Folia (–30) ± conferta, suberecta, interdum glabrescentia. Anthela

racemoso-corymbosa, (1-)2-5(-7)-cephala, pedunculis longis suberectis leviter scaberulis. Involucra quam typi paululum angustiora basi minus truncata. Squamæ lanceolatae, quam in typo paulo angustiores (exteriores apice \pm reflexae), obtusae, glabrescentes vel ad basin sparsim floccosae. Styli lutei. Receptaculi alveoli margine ciliato-subulato-dentati.

Stem (20-)30-50(-70) cm. high, pilose or glabrescent, less scaberulous above than in the type. Leaves (-30) \pm crowded, suberect, sometimes glabrescent. Inflorescence racemose-corymbose, (1-)2-5(-7)-headed, with long, suberect peduncles, which are lightly scaberulous. Heads rather less broad and truncate-based than in the type. Phyllaries lanceolate, rather narrower than in the type (the outer with \pm reflexed tips), obtuse, glabrescent or slightly floccose about the base. Styles yellow. Margins of receptacle-pits ciliate-subulate-dentate.

This handsome and very distinct hawkweed—perhaps the best of Hanbury's discoveries—was first found in 1887 on the sandy cliffs at Melvich, Sutherland, and at Berriedale, Caithness; and a fine series of specimens, just coming into flower, was secured. It was regarded as an undescribed species by Lindeberg, who saw Hanbury's material.

In February 1929, Johnston referred to Dahlstedt for his determination examples of a form growing at Aith Hope, South Walls, Hoy, Orkney; these were returned as *H. inuloides* subsp. *strictum* f. *angustifolia* Dahlst. and published by Johnston (l. c.) accordingly. A sheet of this plant is now in Herb. Mus. Brit. and it is a typical specimen of *H. maritimum*. There are weak examples in Herb. Hanbury, collected near Altnaharra in 1887 and 1888, that likewise seem referable to this species. And further Mr. Wilmott obtained plants in bud near Carloway, Lewis, in 1937, that also seem conspecific.

H. maritimum, whose characters are somewhat intermediate between those of the *Foliosa* and *Umbellata*, is placed in the latter group by Zahn. It is the only known British species possessing the extremely broad, lanceolate phyllaries that characterize *H. crocatum* Fr.

The variety *pauciceps* has hitherto been associated with *H. umbellatum* L. but there is no trace of any umbelliform tendency in the inflorescence of any of the numerous specimens examined, and this, together with the broad phyllaries, seems to indicate a closer affinity with *H. maritimum* than with *H. umbellatum*. It perhaps marks a transition between the two species. A large series of examples was obtained by Hanbury at Inveroran in 1889, and much finer plants by the Carrick river, in Donegal, in 1891. At the latter station the plant was again collected in 1928 by Druce, who reported it as *H. umbellatum* v. *chloromelanum* Dahlst. (Report B.E.C. viii. pt. v. 619 (1929)). There is a doubtful plant in Herb. Mus. Brit. (Groves, L. Leane, S. Kerry, 1892) that resembles var. *pauciceps*, but differs in its finely toothed foliage.

A Scandinavian specimen in Herb. Hanbury (Ahlberg, Gottsunda Uplandiae, 1867, as *H. umbellatum* var. *pauciflorum* Hartm.) may be a form of *H. maritimum*.

Distribution.—108. W. Sutherland: Melvich and Altnaharra (Hanbury). 109. Caithness: Berriedale (Hanbury). 110. Outer Hebrides: Carloway, Lewis (Wilmott). 111. Orkney: South Walls, Hoy (Johnston).

var. *pauciceps*.

96. E. Inverness: Kingussie (W. F. Miller). Kinchuray (Druce). 98. Argyll: Inveroran (Hanbury).

Ireland.—35. W. Donegal: Carrick River (Hanbury).

General Distribution.—Scandinavia?

235. *HIERACIUM OBESIFOLIUM* sp. nov.

Exsicc.—Beeby no. 1634 (type), in Hb. Mus. Brit. and Hb. S.L.B.I.

Caulis 25–35 cm., *robustus*, inferne rubescens, *glabrescens*, anthelam versus floccosus. *Folia* 12–20, *suberecta*, parva, *crassa*, *verisimiliter carnosula*, *sordide olivacea*; basalia obovato-oblonga ad lineari-oblonga, obtuso-mucronata ad subacuta, subintegra, inferne in basin angustam, sessilem, semi-amplexicaulem attenuata; media anguste oblongo-lanceolata ad lanceolata, acuta ad acuminata, *subintegra* vel denticulis paucis solitariis munita, *basi rotundatâ*, *semi-amplexicauli* sessilia; summa anguste ovato-lanceolata, acuminata, subintegra, basi latius rotundata, semi-amplexicaulia; omnia utrinque glabra vel inferiora nonnunquam inferne in costâ dorsali leviter pilosa; marginibus inferiorum \pm ciliatis superiorum obscure scaberulis. *Anthela compacte racemoso-corymbosa*, 2–6-cephala, *acladio ramisque brevibus crassis apice dilatatis*; pedunculis floccosis. *Involucra majuscula, lata, basi truncata*. *Squamae atrovirides*, numerosae, *latae*, lineari-oblongae, obtusissimae, effloccosae, epilossae, *glandulis obscuris paucis solitariis vestitae*. Ligulae apice glabrae. *Styli saturate lutei*.

Stem 25–35 cm. high, *robust*, reddish below, *glabrescent*, becoming floccose above. *Leaves* 12–20, *suberect*, small, *thick and apparently fleshy*, dull olive-green; basal obovate-oblong to linear-oblong, obtuse-mucronate to subacute, subentire, attenuate below to a narrow, sessile, semi-amplexicaul base; median narrowly oblong-lanceolate to lanceolate, acute to acuminate, *subentire* or with very few solitary denticulations, *sessile with rounded, semi-amplexicaul base*; upper narrowly ovate-lanceolate, acuminate, subentire, with more broadly rounded, semi-amplexicaul base; all *glabrous* on both sides or the lower sometimes slightly pilose on the midrib beneath; margins of the lower \pm ciliate, of the upper obscurely scaberulous. *Inflorescence compactly racemose-corymbose*, 2–6-headed, *with short, thick, apically dilated acladium and branches*; peduncles floccose. *Heads large and broad, truncate-based*. *Phyllaries* incumbent in bud, *blackish green*, numerous, *broad*, linear-oblong, very obtuse, effloccose and *epilose*, *with a few solitary fine, dark glandular hairs*. Ligules glabrous-tipped. *Styles deep yellow*. [Receptacular alveoles and achenes not seen.]

This plant is alluded to by Beeby in his description of *H. crocatum* var. *congestum* (Ann. Scot. Nat. Hist. 110–117 (1908)) as a form growing at Sandsting not quite identical with the North Roe plant, which is the type of his variety. It is indeed very different from the North Roe plant, which is of slender growth with relatively few, neatly denticulate leaves, resembling other Shetland forms of the group *Alpestris*. *H. obesifolium* does not appear referable to this group, but is more closely related to *H. maritimum* Hanb., from which it is separable by its broader but more acute leaves, its smooth stem and panicle, and its differently shaped phyllaries. It is the only known Shetland species that falls within the Section *Foliosa*. It was collected by Beeby in 1892 on a holm in Burga Water, near Walls, Sandsting, Mainland, in the Shetlands.

Distribution.—112. Shetland: Mainland (Beeby).

Endemic.

Sect. XII. UMBELLATA.

Fries, Epicr. 132 (1862); Williams, l. c. 83 (1902); Hanb. in Bab. Man. ed. 9, 268 (1904); W. R. Lint. Brit. Hier. 91 (1905); Zahn, l. c. 907 (1922).

Aphyllopodous plants with leafy stems. Leaves sessile, not glaucous or reticulate-veined beneath, often almost linear (rarely oval), with \pm attenuate base and recurved scaberulous margins. Inflorescence, at least at the apex, \pm umbellate, normally many-headed, epilose and eglandular. Phyllaries incumbent in bud, obtuse, the outer squarrose with \pm reflexed tips, nearly glabrous. Ligules glabrous-tipped. Styles normally yellow. Margins of receptacle-pits setaceous-dentate to dentate-fimbriate. Achenes blackish brown.

Flowering August–September (*H. ogweni* a fortnight earlier).

This is a small but distinct Section which, though one of the most widely distributed in the world, contains a relatively few number of forms, the majority of which are clearly related and seem to form one polymorphic species. It is most closely allied to some species of the *Tridentata* and to the Series *Maritima* of the *Foliosa*. The dominant species, *H. umbellatum*, extends over Europe and Northern Asia to Japan and India, and to North America. In Great Britain it is generally distributed over England and Wales, occurring normally in lowland situations. It becomes scarce in Scotland, and in Ireland. *H. bichlorophyllum* seems to be confined to the west of England, Wales, Ireland and the Channel Islands, and *H. ogweni* to Carnarvonshire.

Leaves numerous, dark green, linear to linear-lanceolate, acute, usually with 2-4 teeth or denticulations on each side. Phyllaries blackish green, the outer with recurved tips. Margins of receptacle-pits setaceous-dentate to dentate-fimbriate	<i>H. umbellatum</i> .
Leaves less numerous, bright green, narrowly lanceolate, acute, with 4-5 shallow teeth or denticulations. Phyllaries dull or dark green, the outer lax, scarcely squarrose. Margins of receptacle-pits shortly setaceous-dentate	<i>H. ogweni</i> .
Leaves numerous, clear green, oblong, subacute, subentire or with 1-2 broad, shallow teeth. Phyllaries olive-green, the outer with recurved tips. Margins of receptacle-pits shortly dentate-fimbriate	<i>H. bichlorophyllum</i> .

236. *HIERACIUM UMBELLATUM* L. Sp. Pl. 804 (1753); Smith, Fl. Brit. ii. 835 (1800); Eng. Bot. no. 1771 (1807); Backh. Mon. 72 (1856); Fries, Epicr. 135 (1862); Syme, Eng. Bot. ed. 3, v. 202 (1866); Williams, l. c. 171 (1902); Hanb. in Bab. Man. ed. 9, 268 (1904); Rouy, Fl. Fr. ix. 397 (1905); W. R. Lint. Brit. Hier. 92 (1905); Zahn, l. c. 909 (1922).

Icones.—Eng. Bot. t. 1771 (E. B. ed. 3, 853); Pl. 14, fig. a.

Exsicc.—Lindbg. H. Sc. Exs. iii. 150; Linton no. 50 (Atlow); Hanbury, Lessingham, 1886; Tatum, Stourton, 1890; both in Hb. Hanbury.

Stem (20-)30-80(-100) cm. high, \pm slender, erect, reddish towards the base, usually pilose (especially below) and sometimes floccose or scaberulous above, but often glabrescent throughout. *Leaves dark green*, paler beneath, *numerous* (15-)25-50(-70), often crowded in strong plants, rather thick unless in shade; the lower (frequently very long) \pm linear to *narrowly linear-lanceolate, with 2-3 distant denticulations or spreading teeth* on each side, or *subentire, acute* to acuminate, long-attenuate below but *sessile*; median and upper similar but gradually smaller and more acuminate, with more shortly cuneate or rarely slightly rounded base; all *glabrescent above, \pm scaberulous and floccose beneath*, and generally pilose, especially on the midrib, *with revolute, strongly scaberulous margins*. *Inflorescence subumbellate*, or racemose- or paniculate-corymbose with subumbellate apex, (2-)10-25(-60)-headed, sometimes with \pm short lateral branches from the upper leaf-axils; peduncles finely bracteolate, \pm flocculose, sometimes also slightly scaberulous. *Heads of medium size to rather large*, rounded to truncate below. *Phyllaries* incumbent in bud, the *outer squarrose with recurved tips, blackish* or more rarely *olive-green, numerous* and \pm regularly imbricated, linear-lanceolate from a broad base, obtuse, *glabrous* or rarely slightly flocculose or with a few solitary fine pilose or glandular hairs. Ligules deep yellow, glabrous-tipped. *Styles pure yellow* or very rarely livid. *Margins of receptacle-pits irregularly setaceous-dentate, varying to dentate-fimbriate*. Achenes blackish brown, 3-4 mm. long.

β . *linariifolium* Wallr. Ann. Bot. 100 (1815); Williams, l. c. 172 (1902); W. R. Lint. l. c. 92 (1905); Zahn, l. c. 914 (1922); *H. umbellatum* var. *filifolium* Fries, Symb. 178 (1848); Backh. l. c. 73 (1856).

Exsicc.—Pugsley, Barnes Common, 1903, in Hb. Pugsley.

Leaves very narrow, linear, subentire, \pm glabrescent. Inflorescence elongate, many-headed.

γ. coronopifolium Bernh. ex Hornem. Hort. Hafn. ii. 970 (1815); Fries, Symb. 177 (1848); Epicr. 136 (1862); Williams, l. c. 172 (1902); Hanb. l. c. 268 (1904); W. R. Lint. l. c. 93 (1905); Zahn, l. c. 914 (1922).

Exsicc.—Linton no. 124 (Talbot); Wheldon, Hall Road, 1913; Marshall, Witley, 1888; both in Hb. Hanbury.

Often tall and robust. Leaves linear to narrowly linear-lanceolate, with 2-4 distant, \pm long and curved teeth on each side. Panicle floriferous, \pm elongate.

δ. dunense Reyn. in Hall. Fl. Belg. i. 566 (1825); Rouy, Fl. Fr. ix. 399 (1905), as 'forme'; Zahn, l. c. 914 (1922); *H. umbellatum* var. *litorale* Lindbg. Hier. Sc. Exs. i. 50 (1868); Hanb. l. c. 268 (1904).

Exsicc.—Lindbg. H. Sc. Exs. i. 50; Babington, Penally, 1851, in Hb. Backhouse; Lewis, Wallasey, 1869, in Hb. Hanbury.

Stem 15-30 cm. high, flexuous, ascending from a decumbent base, glabrous or \pm pilose below. Leaves \pm crowded, linear-lanceolate, remotely or obscurely toothed. Inflorescence compact, (2-)5-10(-15)-headed.

ε. commune Fries, Symb. 178 (1848); Zahn, l. c. 910 (1922); *H. umbellatum* var. *paniculatum* Cariot, Études, v. 380 (1872); W. R. Lint. l. c. 93 (1905); *H. umbellatum* var. *serum* Sudre, Hier. Centr. Fr. 12 (1902) ?

Exsicc.—Backhouse, Langwith, 1851, in Hb. Backhouse; Griffiths, Bangor, 1890, in Hb. Hanbury.

Normally tall and robust. Leaves very numerous, linear-lanceolate, with 2-3 \pm short teeth on each side. Panicle elongate and floriferous; peduncles often long; phyllaries dark olive-green.

H. umbellatum, one of the most widely spread of hawkweeds, is readily distinguishable in all its forms by its narrow leaves with revolute, asperous margins and usually distant, spreading teeth; further, by its subumbellate inflorescence, its squarrose phyllaries and its peculiarly setaceous- or fimbriate-dentate alveoles. Zahn, following Fries, treats as the typical form a plant with narrowly lanceolate foliage, but this does not accord with Linnaeus's original diagnosis, which runs (l. c.) 'H. foliis linearibus subdentatis sparsis, floribus subumbellatis', nor with the specimen in the Linnaean herbarium, in which the leaves are linear and scarcely toothed. According to Jackson's index this specimen was placed in the herbarium after 1753 and so cannot be taken as a specific type, but there are two earlier specimens in the Hortus Cliffortianus, cited by Linnaeus for this species, which have still narrower leaves; and it thus appears that Linnaeus was acquainted with a linear-leaved form and that such must be regarded as typical *H. umbellatum*.

Understanding the specific type in this sense, it becomes necessary to restrict the varietal name *linariifolium* to forms with truly linear and subentire foliage. The Herb. Mus. Brit. possesses a plant of this kind collected by Merrick in 1730 on Barnes Common, Surrey, where it was still growing abundantly in 1903.

The variety *littoreum* Arv.-Touv. appears to have been inserted in W. R. Linton's 'British Hieracia' for Jersey through some confusion with var. *litorale* Lindbg. According to Arvet-Touvet (Hier. Alp.-Fr. p. 126) it is a plant with 'tige élevée' and 'panicule allongée', quite different from the decumbent coast-form.

Of the material referred to var. *pauciflorum* Hartm. by W. R. Linton (l. c.) Marshall's Skerry specimens recall var. *dunense*, while the Inveroran plant appears to belong to *H. maritimum* rather than *H. umbellatum* and has been dealt with accordingly. No specimens have been seen from the other stations cited.

Forms intermediate between the above-mentioned varieties and the typical species are of frequent occurrence.

Parkinson, in the 'Theatrum' (1640), remarks that he saw this plant 'in the way to Hampstead Heath and back again', and Petiver, in his 'Catalogue'

(1713), figures two forms (Pl. xiii. f. 11 and 12), apparently the type and var. *linariifolium*, from 'Hamsted Woods'. In the third edition of Ray's Synopsis (1724) Dillenius remarks of the latter 'circa Londinum sed rarius'.

The number of vice-counties shown for Ireland is almost certainly an underestimate. According to Praeger (Botanist in Ireland) it should be eighteen.

Distribution.—1. W. Cornwall : Trellick Common (Morgan). Madron (Bunting). Gulval (E. S. Gregory). 2. E. Cornwall : Boscastle (Riddelsdell). 3. S. Devon : Plymouth (Keys). Newton Abbot (Stephenson). 4. N. Devon : Tiverton (Still). Okehampton (Barton). 5. S. Somerset : Pen Selwood (Murray). 8. S. Wilts : Stourton (Tatum). 9. Dorset : Portisham (Whitwell). 11. S. Hants : Bournemouth (Linton). New Forest (Cunningham). 12. N. Hants : Aldershot (Hall). 13. W. Sussex : Storrington (Rendle). Selham (Lacaita). 14. E. Sussex : Eridge ! Furnace Wood (Marshall). 15. E. Kent : Maidstone (Hanbury). Cheriton (Young). 16. W. Kent : Leybourne (Hanbury). Pembury ! 17. Surrey : Cheam ! Ashtead (Lousley). Raynes Park ! Wimbledon ! Esher ! Chobham ! Witley (Marshall). Redhill (Linnell). 18. S. Essex : Snaresbrook (E. Forster). 21. Middlesex : Hounslow (Newbould). 23. Oxford : Somerton (Riddelsdell). 25. E. Suffolk : Oulton (Smith). Sotterley (E. Forster). 27. E. Norfolk : Thorpe (Smith). Lessingham (Hanbury). Sprouston (Linton). Caister (Miss Campbell). 28. W. Norfolk : Thetford (Hort). 30. Bedford : Amptill (J. Brown). 32. Northants : Daventry (—). 37. Worcester : Bewdley (Backhouse). 38. Warwick : Rugby (—). 39. Stafford : Biddulph (Painter). 41. Glamorgan : Mumbles (Hopkins). Aberdare (Riddelsdell). 42. Brecon : Llanwrtyd ! Newbridge (Ley). Colbren (Barton). 44. Carmarthen : Llwehyd River (Ley). 45. Pembroke : St. David's (Ridley). 46. Cardigan : Hafod (Smith). Aberarth (Marshall). Maesnant (Ley). Aberystwyth (Barton). 47. Montgomery : Llangurig (J. Bedford). 48. Merioneth : Festiniog (Borrer). 49. Carnarvon : Cwm-y-glo (Catcheside). Bettws-y-Coed ! Pwllheli (Bailey). 50. Denbigh : Conway Falls ! 51. Flint : Overton, 1766 (—). 54. N. Lincs : Rasen (F. A. Lees). Eltham (Ley). 55. Leicester and Rutland : Lindbridge (Horwood). Bardonia Hill (A. B. Jackson). 57. Derby : Atlow (W. R. Linton). Buxton (Painter). 58. Cheshire : Temperley (Bickham). 59. S. Lancs : Melling and Southport (Wheldon). Bootle (Gourlie). 60. W. Lancs : Lytham (Melvill). Ansdell (Marshall). 62. N.E. Yorks : Strensall (Wheldon). Leckley Carr (Riddelsdell). Thirsk (Baker). Stokesley (Macreight). 63. S.W. Yorks : Bawtry (F. A. Lees). 64. M.W. Yorks : Carlton Bridge (Parsons). 65. N.W. Yorks : Winch Bridge (Backhouse). 66. Durham : Stockton (Backhouse). Winch Bridge (F. A. Lees). Sunderland (Bowman). 72. Dumfries : Sanquhar (Davidson). 74. Wigton : Galloway (Balfour). Luce (McAndrew). 75. Ayr : Ballantrae (Somerville). 80. Roxburgh : Stichell (Brotherston). 82. E. Lothian : Bass Rock, 1841 (—). 86. Stirling : Avon Bridge (Stirling). 88. Mid Perth : Glen Lyon (W. F. Miller). 89. E. Perth : Dunkeld (G. Don). 90. Forfar : Clova (Linton). Sands of Barry (Corstorphine). 96. E. Inverness : Kincaig (Somerville). 103. Mid Ebudes : Heatherfield (Ross). 108. W. Sutherland : Farr (W. H. Campbell).

Ireland.—1. S. Kerry : Glen Caragh (Ley). Glen Car (Hanbury). 6. Waterford : Kilmacow (Chandlee). 11. Kilkenny : Lower Kilmacow (Chandlee). 15. S.E. Galway : Lough Derg (Phillips). 16. W. Galway : Lough Corrig, Maam (Babington). 17. N.E. Galway : Rossmore (Linton). 20. Wicklow : Valleymount (Brunker). 21. Dublin : Glennasmole (Chandlee). 27. W. Mayo : Achill Is. (Praeger). 35. W. Donegal : Glenties (Hart).

Channel Is.—Jersey (Bailey).

var. *linariifolium*.

16. W. Kent : Hayes ! Sevenoaks (Rudge). 17. Surrey : Barnes ! N. Camp (Beeby). 66. Durham : Hartlepool (F. A. Lees). 88. Mid Perth : Glen Lyon (Linton).

var. coronopifolium.

5. S. Somerset : Kingston and W. Monkton (Marshall). 8. S. Wilts : Mere Down (Linton). 10. Wight : Knighton (Stratton). 11. S. Hants : Sholing (Rayner). Talbot (Linton). 12. N. Hants : Oakhanger (Burdon). Silchester (Lousley). Woolmer Forest (Vaughan). Aldershot (Holl). 13. W. Sussex : Arundel (E. Forster). Graffham (Barton). 14. E. Sussex : Hassocks (Hilton). Eridge! 15. E. Kent : Wye (Hanbury). 16. W. Kent : Hayes! Leybourne (Marshall). 17. Surrey : Byfleet (Wallace). Witley (Marshall). 22. Berks : Virginia Water (Dewar). 30. Bedford : Maulder (Dony). 34. W. Glo'ster : Cam (Day and Knight). 53. S. Lincs : Doddington (Ley). 56. Notts : Collingham (Fisher). 59. S. Lincs : Hall Road (Wheldon). 65. N.W. Yorks : Teesdale (Mennell). 70. Cumberland : Brampton (Fox). 72. Dumfries : Moffat (Johnston). 74. Wigton : Sorbie (McAndrew). 96. E. Inverness : Rothiemurchus (Roffey).

Ireland.—20. Wicklow : Lough Tay (Praeger). 39. Antrim : Glenariff (Stewart). *var. dunense.*

54. Pembroke : Tenby! Penally (Babington). 46. Cardigan : Aberystwyth (Stephenson). 58. Cheshire : Wallasey (Lewis). 97. W. Inverness : Keppoch (W. F. Miller).

Channel Is.—Jersey (Bailey). Guernsey (Hanbury?). Alderney (A. B. Jackson). *var. commune.*

6. N. Somerset : Ashcott (Marshall). 16. W. Kent : Lamberhurst! 27. E. Norfolk : Catfield (Robinson). Lessingham (Hanbury). 31. Hunts : Holme Fen (Ley). 34. W. Glo'ster : Yate Common (D. Fry). 38. Warwick : Burley (Kirk). 39. Stafford : Knypersley (Painter). 40. Shropshire : Ellesmere (Beckwith). 41. Glamorgan : Crynant (Riddelsdell). Peterston (Ley). 42. Brecon : Builth! 49. Carnarvon : Bethesda (Barton). Bangor (Griffiths). 53. S. Lincs : Skellingthorpe (Fisher). 54. N. Lincs : Fordingham (Fowler). 57. Derby : Atlow (W. R. Linton). 62. N.E. Yorks : Askham (F. A. Lees). 64. M.W. Yorks : Langwith (Backhouse). Ingleborough (F. A. Lees).

Ireland.—20. Wicklow : Devil's Glen (Carroll).

General Distribution (of the species).—Europe. N. Asia. N. America.

237. *HIERACIUM OGWENI* Linton in Journ. Bot. xxxv. 407 (1897); *H. corymbosum* f. *subumbellata* Williams, l. c. 174 (1902); *H. umbellatum* var. *ogweni* Hanb. in Bab. Man. ed. 9, 268 (1904); Zahn, l. c. 911 (1922); *H. umbellatum* subsp. *ogweni* W. R. Lint. Brit. Hier. 93 (1905).

Exsicc.—Linton, Bethesda, 1895, and no. 75 (Tregarth); both in Hb. Mus. Brit.

Stem 50–70 cm. high, erect, rather slender, green, slightly pilose below, *glabrescent* or \pm *floccose* upwards. *Leaves* bright green, 15–25(–30); the lowest narrowly lanceolate (broadest near the middle), with 4–5 distant, shallow, \pm spreading teeth or denticulations on each side, acute, attenuate below to short, winged petioles; median and upper sessile, similarly lanceolate and toothed, decreasing upwards and becoming apically acuminate and less attenuate below; all *glabrescent* above, \pm *floccose* and slightly pilose beneath, margins lightly scaberulous or occasionally ciliate. *Inflorescence* subumbellate or paniculate-corymbose with \pm subumbellate apex, 5–20(–40)-headed, with straight, erect-spreading sometimes subumbellate branches exceeding the *accladium*; peduncles \pm *flocculose*. *Heads* of medium size, truncate-based. *Phyllaries* incumbent in bud, the outer lax but scarcely squarrose, dull or dark green, \pm numerous, linear-lanceolate, obtuse, *glabrous* or very sparingly glandular. *Ligules* glabrous-tipped. *Styles* yellow. *Margins of receptacle-pits* shortly setaceous-dentate. *Achenes* blackish brown, about 3 mm. long.

This rare plant, discovered by Linton in 1890 by the river Ogwen, near Bethesda, Carnarvonshire, is allied to *H. umbellatum* but differs in its more glabrous habit, its less crowded, bright green and more regularly toothed foliage, its more paniculate inflorescence, with paler heads and non-recurving phyllaries, and its more shortly toothed alveoles. It is reduced to a variety of *H. umbellatum* by Zahn (l. c.), who records it for Switzerland, Germany, Russia and North America, but its identification with the continental plant may be doubted. It evidently extends in North Wales from Tregarth and Bethesda to the head of Nant Francon and beyond, for in 1922 I collected a specimen, just coming into flower, close to the Ogwen Falls, and in 1943 a fine series of examples at Pen-y-Pass.

Distribution.—49. Carnarvon : Tregarth and Bethesda (Linton). Nant Francon ! Pen-y-Pass !

Endemic ?

238. *HIERACIUM BICHLOROPHYLLUM* (Druce and Zahn) Pugsley in Journ. Ecol. xxxiii. 347 (1946).

H. laevigatum Willd. subsp. *bichlorophyllum* Druce and Zahn in Bot. Exch. Club (B. I.) Report, ix. pt. 5, 561 (1932) ; *H. umbellatum* var. *Taylorii* Babington Man. ed. 1, 186 (1843) ? ; *H. umbellatum* var. *monticola* Williams, l. c. 173 (1902) ; W. R. Lint. Brit. Hier. 93 (1905) ; Zahn, l. c. 913 (1922) ; non *H. monticola* Jord. Cat. Gren. 20 (1849).

Exsicc.—Druce, Molland, 1930 (type), in Hb. Druce ; Linton no. 135 (Bigbury, cult.), as *H. umbellatum* var. *monticola* ; Pugsley, Saundersfoot, 1923, in Hb. Pugsley.

Stem 25–50(–70) cm. high, erect, ±slender, or robust in exposed situations, slightly reddish below, pilose with spreading hairs towards the base, ±floccose and a little scaberulous above. *Leaves* clear green, paler beneath, (15–)20–40(–55), ±crowded ; the lower oval-oblong to oblong, obtuse-mucronulate to subacute, subentire or obscurely sinuate-denticulate, attenuate below, sessile or the earliest subpetiolate ; median *oblong* to lanceolate, *subacute* (sometimes becoming acuminate), *subentire* or occasionally with 1–2(–4), broad, shallow teeth on each side, sessile with shortly cuneate or somewhat rounded base ; upper smaller, lanceolate, acuminate, subentire or remotely denticulate, rounded below and sessile ; all *glabrescent* or sparingly pilose above, *pilose* and ±*floccose* and *asperous* beneath, margins scaberulous with some ciliate hairs intermixed. *Inflorescence* subumbellate or paniculate-corymbose, (3–)8–15(–35)-headed, sometimes with short lower branches from the upper leaf-axils ; peduncles finely bracteolate, floccose, rarely with a few spreading pilose hairs. *Heads* of medium size, rounded below. *Phyllaries* incumbent in bud, the outer *squarrose* with *reflexed tips*, olive- or sometimes blackish green, numerous, linear-lanceolate, obtuse, *glabrescent* or rarely ±floccose and microglandular. Ligules glabrous-tipped. Styles yellow. *Margins of receptacle-pits* shortly *dentate-fimbriate*. Achenes blackish brown, 3–3.5 mm. long.

β. *curtum* (Linton) comb. nov.

H. umbellatum var. *curtum* Lint. in Journ. Bot. xxxi. 201 (1893) ; Williams, l. c. 173 (1902) ; Hanb. in Bab. Man. ed. 9, 268 (1904) ; W. R. Lint. Brit. Hier. 93 (1905).

Exsicc.—Linton no. 185 (Jersey), as *H. umbellatum* var. *littoreum* ; Griffiths, Abersoch, 1891, in Hb. Hanbury.

Stem 10–30 cm. high, suberect, slender, flexuous. Leaves generally glabrescent. Panicle 1–12-headed ; phyllaries dark and rather broad. Margins of receptacle-pits dentate-fimbriate. Otherwise like the type.

H. bichlorophyllum has hitherto been generally identified with *H. umbellatum* var. *monticola* (Jord.), and 'England' is cited under this variety in Zahn's Mono-

graph. Jordan's *H. monticola*, however, according to his original description (l. c.), and as shown by his own specimens in Herb. Mus. Brit., is a stiffly erect plant, with crowded, suberect, linear-oblong or linear leaves, and a compact, subumbellate inflorescence, which is more closely related to typical *H. umbellatum* and clearly distinct from *H. bichlorophyllum*. The foliar characters of *H. bichlorophyllum*, though eminently variable, seem sufficiently distinct to warrant its specific segregation from *H. umbellatum*, but it is impossible to follow Zahn, who wrote the original description, in placing it as a subspecies under *H. laevigatum* Willd., for its affinity unquestionably lies with *H. umbellatum*. The mistake is no doubt due to the inadequate material sent to Zahn by Druce for examination.

The variety *curtum* (Lint.), which seems to be omitted from Zahn's Monograph, was originally described by Linton from Carnarvonshire specimens, and their identity with the coastal plants in Herb. Hanbury which had been collected in Sark and later on the north coast of Jersey was overlooked. The Jersey plant was sent out in Linton's set (no. 185) as *H. umbellatum* var. *littoreum* Arv.-Touv., which, as stated under *H. umbellatum*, is a widely different form. The variety *curtum* seems to be a coast-form of *H. bichlorophyllum* analogous to *H. umbellatum* var. *dunense*. A dwarf, fleshy, sometimes 1-headed form, occurring at Ilfracombe and Lynton, should perhaps be referred to it.

Linton's set no. 159 (*H. umbellatum* L. f. *latifolia*), cultivated from a Kingston, S. Devon plant, is a luxuriant example of *H. bichlorophyllum* with numerous, abnormally toothed leaves. The set, however, is not homogeneous, some sheets having a plant belonging to the Section *Sabauda*.

H. bichlorophyllum is essentially a species of the south-west of England and Wales, and of Ireland, which does not appear to match any of the described broad-leaved French varieties of *H. umbellatum*.

Distribution.—1. W. Cornwall: Madron (Fox). Helston (Marshall). 2. E. Cornwall: Seaton (Briggs). 3. S. Devon: Bigbury and Kingston (Marshall). Kingsbridge! Morwell (Baker). Drewsteignton (Fraser). 4. N. Devon: Molland (Druce). Lynton! Woodabay! Ilfracombe (Rogers)! Morthoe! Clovelly (Ley). 5. S. Somerset: Porlock (Murray). 34. W. Glo'ster: Yate (White). 41. Glamorgan: Cynant, Abernant and Aberdare (Riddelsdell). 42. Brecon: Llanwrtyd! Pan Pont (Ley). 43. Radnor: Rhos Goch (Ridley). 45. Pembroke: Saundersfoot! 46. Cardigan: Newquay (Marshall). Aberystwyth (J. Ball). 48. Merioneth: Glendovey (Percival). Tyn y Groes (Barton). Llangefni (J. Ball). 49. Carnarvon: Bethesda (Barton). Pwllheli (Bailey). 50. Denbigh: Capel Garmon! 52. Anglesea: Ty Croes (Linton).

Ireland.—1. S. Kerry: Killarney (Scully). 6. Waterford: Blackwater (Stelfox). 27. W. Mayo: Achill I. (Praeger). 33. Fermanagh: Lough Erne (Barrington). 35. W. Donegal: Glenties (Hart).

var. *curtum*.

49. Carnarvon: Abersoch (Griffiths).

Channel Is.—Sark (Hurst). Jersey (Lester-Garland).

Endemic?

Section XIII. SABAUDA.

Fries, *Epicr.* 127 (1862); Williams, l. c. 84 (1902), ex parte; Hanb. in Bab. Man. ed. 9, 267 (1904); Zahn, l. c. 941 (1922); *Foliosa* W. R. Lint. Brit. Hier. 87 (1905), ex parte.

Aphyllopodous (rarely pseudophyllopodous) plants with hirsute, leafy stems. Leaves (sometimes aggregated about the middle of the stem) \pm heteromorphous, the lower \pm lanceolate, attenuate below and sometimes subpetiolate, the upper \pm ovate, sessile with rounded but not amplexicaul base; all paler and often densely

pilose beneath, not reticulate-veined; leaf-margins ciliate or scaberulous, scarcely thickened. Inflorescence racemose- to paniculate-corymbose, often pilose, with bracteolate peduncles and numerous rather small to large heads. Phyllaries incumbent in bud, appressed or the outer lax, rarely with \pm recurved tips, obtuse, dark and usually concolorous, pilose with long, whitish hairs and/or with fine, yellow-headed, \pm appressed glandular hairs or microglands, or glabrescent, at most only sparingly floccose. Ligules glabrous-tipped. Styles livid, except in *H. croceostylum* and *H. subquercetorum*. Margins of receptacle-pits sharply dentate with \pm rigid, erect, setaceous-pointed or fibrillous teeth. Achenes purplish or blackish brown.

Flowering August–October.

The plants of this Section are closely related to the *Foliosa* but differ in several particulars and have not the same geographical distribution. Their stems are normally more pilose, and their leaves generally more definitely heteromorphous, more hirsute, and less conspicuously veined. Their dark, nearly concolorous and usually rather broad phyllaries produce a characteristic indumentum. The pilose hairs are long, flexuous, whitish with a dark base, and akin to those of the stem and peduncles, and the glandular are fine, short, dark but yellow-headed, and more or less appressed, gradually passing into microglands. These two forms of hair-clothing may, one or both, be abundant, sparing or entirely wanting. Floccose or stellate hair is found very sparsely and is often confined to the edges of the outer phyllaries. The fibrillous-dentate margins of the alveoles are general and more marked than in any other British Section. In no other group of British hawkweeds can environment produce such great vegetative variation, and the recognized species are less well marked than in most of the other generic Sections. Apparently intermediate forms are sometimes to be found.

A number of French species of the group were described by Jordan, and many more appeared under his name in the third edition of Boreau's 'Flore du centre de la France' (1857). These forms were ignored by Fries and till recently in British botany. In 1902 they were elaborately dealt with in Sudre's 'Hieracium du centre de la France', and in 1905 two of them were admitted as varieties of *H. boreale* Fr. in W. R. Linton's handbook. Zahn's Monograph treats thirteen of Jordan's plants and five of Sudre's as subspecies of an aggregate *H. sabaudum* L., and gives six of them as natives of Great Britain.

The *Sabauda* are plants of Spain, France and Central Europe, extending to South Russia and Asia Minor. They occur rarely in South Scandinavia. The eleven British species here described are chiefly inhabitants of England and Wales. Three only, *H. Bladonii*, *H. vagum* and *H. sublactucaceum*, reach Scotland, and the first of these is the sole representative of the group in Ireland. As at present known, three are local species of Wales, one of Yorkshire, and one of the south-west of England.

Series *Eu-Sabauda* [Grex *H. sabaudum* L.].

Stem \pm densely pilose, at least below. Peduncles floccose and often long-pilose. Phyllaries with \pm numerous long pilose hairs as well as fine glandular hairs.

Leaves dark green, median lanceolate to narrowly rhombic-lanceolate with fine, sharp teeth. Inflorescence with long or short branches. Phyllaries dark or blackish green, nearly concolorous, \pm densely glandular, with numerous pilose hairs

H. Bladonii.

Leaves paler green, median lanceolate to elliptic-lanceolate with few fine teeth. Inflorescence with \pm long, spreading branches. Phyllaries shorter, olive-green, not concolorous, \pm densely pilose, also glandular

H. perpropinquum.

Leaves deep green, suberect, median rhombic-lanceolate, very sharply toothed. Inflorescence with strict, suberect branches. Heads large.

Phyllaries blackish green, densely glandular and fairly pilose

H. argutifolium.

Leaves bright green, median \pm ovate-lanceolate, sharply toothed and \pm broad-based. Inflorescence with suberect branches. Peduncles sparingly pilose. Phyllaries blackish green, densely glandular, \pm pilose

H. eminentiforme.

Series *Borealia* [Grex *H. boreale* Fr.].

Stem less pilose, at least above. Peduncles generally floccose only. Phyllaries finely glandular or not, with only few or solitary pilose hairs or none.

* Phyllaries densely glandular.

- Leaves bright green, narrow, median lanceolate, sparingly denticulate, shortly cuneate-based. Inflorescence with slender, suberect branches. Heads rather small. Phyllaries dull olive-green *H. virgultorum*.
- Leaves dark green, firm, median lanceolate, irregularly toothed, shortly cuneate-based. Inflorescence with long, strict, suberect branches. Heads of medium size. Phyllaries olive- or blackish green *H. rigens*.
- ** Phyllaries blackish green, eglandular, nearly glabrous.
- Leaves deep green, suberect, median \pm oval-elliptic, serrate. Inflorescence generally with short, suberect branches. Heads \pm large. Phyllaries sometimes slightly floccose or rarely \pm pilose *H. vagum*.
- Leaves paler green, long, median lanceolate, slightly toothed. Inflorescence with short, suberect branches. Heads of medium size. Phyllaries sometimes obscurely floccose *H. sublactucaceum*.
- Leaves deep green, suberect, median elliptic-lanceolate, remotely serrate. Inflorescence with \pm long, erect-spreading branches. Heads large. Plant dwarfier with fewer leaves, pseudophyllopodous *H. calvatum*.
- Leaves deep green, firm, median elliptic- to ovate-lanceolate with few, sharp teeth. Inflorescence with short, suberect branches. Heads large. Phyllaries sometimes slightly floccose. Styles yellow *H. croceostylum*.
- Leaves dull green, firm, median broadly ovate with subcordate base and unequal teeth. Inflorescence with short, suberect branches. Heads of medium size. Styles yellow *H. subquercetorum*.

Series **Eu-Sabauda**. (See page 298.)239. *HIERACIUM* BLADONII nom. nov.

H. heterophyllum Bladon in Phytol. ii. 961 (1847), non Retzius, Obs. bot. ii. 24 (1781); *H. boreale* Fr. Symb. 190 (1848) and Epicr. 130 (1862), ex parte; *H. obliquum* Boreau, Fl. Centr. Fr. ed. 3, ii. 384 (1857)?, non Jordan, Cat. Dijon, 23 (1848); *H. boreale* subsp. *obliquum* Sudre, Hier. Centr. Fr. 18 (1902); Rouy, Fl. Fr. ix. 385 (1905), ex parte; *H. sabaudum* subsp. *obliquum* Schinz and Keller, Fl. Schweiz, ed. 2, ii. 343 (1905); Zahn, l. c. 946 (1922).

Icon.—Sudre l. c. pl. iii.

Exsicc.—Bladon, Pont-y-Pool, 1847, in Hb. Mus. Brit., as *H. heterophyllum*; Backhouse, Teesdale, 1850, in Hb. Backhouse, as *H. boreale*; Hanbury, Wye, 1892; Marshall no 4425; both in Hb. Hanbury, as *H. boreale*; Pugsley no 815, in Hb. Pugsley; Linton no 100 (Hamworthy), as *H. boreale* var. *Hervieri*.

Occasionally \pm pseudophyllopodous. Stem usually (30-)50-80(-120) cm. high, robust, striate, often \pm tinted with reddish, *densely long-pilose* with spreading, bulbous-based, whitish hairs below, becoming less so and often scaberulous upwards but sometimes densely pilose throughout (var. *aspericaule* (Jord.)). Leaves dark or dull green, numerous, 20-40(-70), sometimes crowded below the middle of the stem, *heteromorphous*, rarely very thin, not reticulate-veined beneath; the lower long, lanceolate or narrowly rhombic-lanceolate, acuminate, with fine, sharp, \pm ascending teeth somewhat interspersed with serrulations, very long attenuate (but sessile) below; the median elliptic-lanceolate, acuminate, similarly toothed, sessile with \pm shortly cuneate to rounded base; the upper small, ovate-lanceolate or ovate, acuminate, finely dentate, with rounded, sessile base; all *glabrescent* above, *long-pilose* (especially on the midrib) *beneath*, with ciliate margins sometimes becoming scaberulous. Inflorescence *paniculate-corymbose*, 20-45(-60)-headed, \pm compact or compound with long, erect-spreading, leafy branches from the upper leaf-axils, branches and peduncles \pm floccose, with scattered or dense, spreading pilose hairs. Heads of medium size to rather large, rounded or subtruncate below, and subtended by loose bracteoles. Phyllaries incumbent in bud, dark or blackish green, nearly concolorous,

numerous, linear-lanceolate, obtuse, with \pm dense, fine, subappressed glandular hairs' and \pm numerous long, whitish pilose hairs, especially towards the base. Ligules glabrous-tipped. Styles dark livid. Margins of receptacle-pits subulate-dentate, the teeth produced into long, erect, fibrillous setae (\sim 3 mm. long). Achenes blackish brown, 3-4 mm. long.

β . Brunkeri var. nov.

Exsicc.—Pugsley no. 816 (Glenmacnass, type), in Hb. Pugsley.

Caulis robustissimus, \sim 100 cm. altus. Folia quam typi pauciora, latitudine variabilia, superiora vulgo late ovato-acuminata. Anthela (3-)10-20-cephala, ramis suberectis. Involucra magna ad maxima. Squamae atrovirides, quam in typo magis pilosae minus glandulosae.

Stem very robust, \sim 100 cm. high. Leaves less numerous than in the type, of variable width, upper usually broadly ovate-acuminate. Panicle (3-)10-20-headed, with suberect branches. Heads large to very large. Phyllaries blackish green, more pilose and less glandular than in the type. Otherwise typical.

This plant, originally included with *H. sabaudum* L. by Smith, was subsequently identified by Babington (Man. ed. 3, p. 199) with *H. boreale* Fr. after Fries (Symbolae, p. 190 (1848)) had revised the circumscription of that species. It has since been continuously known in British botany as *H. boreale* Fr. until Roffey's recent segregation in the London Catalogue, ed. 11, to meet the arrangement in Zahn's Monograph, led to the adoption of Jordanian and other names. Fries's species, even in the 'Epicrisis', clearly includes a number of forms, and Zahn regards *H. boreale* Fr. only as a group of subspecies forming part of an aggregate species *H. sabaudum* L. Accepting this view, a consideration of the names used by Zahn as representing the British forms necessitates an enquiry into the status of *H. heterophyllum* Bladon, an earlier name which has been passed over. It was ignored by Babington, and is relegated by Backhouse (Mon. p. 79) to a synonym of *H. boreale*. Fries, in his 'Epicrisis', similarly shows it as a synonym.

It is clear that *H. heterophyllum* was validly published by Bladon (l. c.). Its diagnosis runs:—'Leaves all sessile, cauline, lowest lanceolate, upper ovate, acuminate', and a fairly detailed description is furnished. The pilose stem and foliage are emphasized, and the phyllaries are stated to be densely pilose and with dense arachnoid pubescence. This arachnoid pubescence is presumably the fine, appressed glandular indumentum, whose nature was apparently not appreciated by Bladon. He truly adds 'Capitate glands very rare'. The accurate identification of *H. heterophyllum* is assured by the homogeneous set of exsiccatae which Bladon sent out from Pont-y-Pool, Monmouth, at the time of writing his paper. At least eight sheets of this set, obtained at different times from different sources, are now in Herb. Mus. Brit. and Herb. Hanbury, and remove all possibility of ambiguity. *H. heterophyllum* is akin to *H. obliquum* Jord., as understood by Zahn (who cites it for Britain), and is the most widely distributed species of the *Sabauda* in these islands. It does not agree with Jordan's original description in Cat. Dijon, for it produces no autumnal rosettes, may attain a height of $3\frac{1}{2}$ ', as given by Bladon, instead of 4-6 dec., and has more or less densely glandular as well as pilose phyllaries. Autumnal rosettes are not usually mentioned by later authors, and while Rouy (l. c.) follows Jordan in attributing to *H. obliquum* eglandular phyllaries, the opposite view is held by Boreau, Sudre and Zahn. In this, as in some other cases in this group, Jordan's available exsiccatae are not very characteristic. His own specimens at Kew (Yvoir, 1852, and D'Oullins) are as much as 8 dec. high, with stems more leafy than in Zahn's description, and glandular as well as probably pilose phyllaries. The pilose hairs are not evident but may have worn away from the specimens. There is thus some doubt respecting the real characters of *H. obliquum*, and the restoration of the earlier certain name, *H. heterophyllum* Bladon, which also antedates *H. boreale* Fries. Symb. (1848), would be very desirable, but unfortunately this is

prohibited by the existence of an earlier though illegitimate *H. heterophyllum* Retzius, Obs. bot. ii. 24 (1781), which is not a *Hieracium* in the modern sense. Unless, therefore, a nom. nov. is introduced to represent *H. heterophyllum* Bladon, it is necessary to use Jordan's name *H. obliquum*, as interpreted by Sudre and Zahn. Sudre has applied this name to British plants (in Hb. Lacaita) that are surely *H. heterophyllum* Bladon, and Zahn cites Scottish specimens that he has seen from Perthshire, where the same form is known to grow. If Jordan's name is used, however, for the British plant, its specific description needs such a radical emendation that it essentially contradicts Jordan's original account, which referred not to any aggregation of forms but to a definite segregate. This seems an illogical course, and it is therefore proposed to adopt a new name, *H. Bladonii*, to represent Bladon's species, of whose identity there can be no doubt.

The variety *Brunkeri* is a rather handsome plant, with large, showy flower-heads, that has been repeatedly sent to me by Mr. J. P. Bruncker from stations in County Wicklow. When well-grown, it is distinct enough, but plants undoubtedly occur connecting it with normal *H. Bladonii*.

H. fruticosum latifolium hirsutum, which is presumably this species but possibly the next, *H. perpropinquum*, is recorded by Parkinson (Theatrum (1640)) as growing with *H. umbellatum* near Hampstead Heath, and is said by Ray (Synopsis 44 (1690)) to be very common about Hampstead and Highgate. It is figured by Petiver from 'Hamsted Woods' (Catalogue, pl. xiii. f. 7 (1713)).

Distribution.—2. E. Cornwall : Callington (Briggs). 7. N. Wilts : Clyffe Pypard (Goddard). 8. S. Wilts : Haddon Hill (Grose). 9. Dorset : Hamworthy (Linton). 10. Wight : Borthwood (Rayner). 11. S. Hants : Talbot (Linton). 12. N. Hants : Hazeley Heath (Miss Palmer). 13. W. Sussex : Selham (Lacaita). 14. E. Sussex : Groombridge! West Hoathly (Burdon). Lindfield (Standen). 15. E. Kent : Wye (Hanbury). 16. W. Kent : Pembury! 17. Surrey : Shackleford and Witley (Marshall). Chobham! 18. S. Essex : Woodford (E. Forster). 19. N. Essex : Colchester (Brown). 20. Herts : Hitchin (Little). 21. Middlesex : Northwood (G. S. Williams). 23. Oxford : Wigginton (Riddelsdell). Shotover (A. E. Ellis). 27. E. Norfolk : Stratton (Tuck). 30. Bedford : Clophill (Dony). 32. Northants : Daventry (—). 34. W. Gloucester : Poolhill (Haines). Tortworth (Day). Stoke Bishop (White). 35. Monmouth : Pont-y-Pool (Bladon). Taren-yr-Esgob (Ley). 36. Hereford : Bishopstone (Ridley). Great Doward (Linton). 37. Worcester : Bewdley (Westcombe). Malvern (Towndrow). 41. Glamorgan : Aberdare and Radyr (Riddelsdell). Swansea (J. Ball). 42. Brecon : Llanwrtyd! Nant Gwyllt (Ley). 43. Radnor : Llandrindod (Barton). 47. Montgomery : Llanbrynmair (E. Forster). 55. Leicester : Hallgate (Bell). Cropstone (Preston). 56. Notts : Collingham (Fisher). 62. N.E. Yorks : York (Backhouse). 64. M.W. Yorks : Settle (Tatum). 65. N.W. Yorks : Teesdale (Backhouse). Sedbergh (Wilson). Dentdale (Oliver). 66. Durham : Teesdale (Backhouse). 69. Westmorland etc. : Dungeon Gill! Grasmere (Fox). Ulverston (Hodgson). 70. Cumberland : Keswick (Standen). 72. Dumfries : Eskdale (—). Sanquhar (Davidson). 73. Kirkeudbright : Glen Ferrig (—). 77. Lanark : Glasgow (Lyon). 83. Edinburgh, Balerno (Bayley Balfour). Dalhousie (—). Carberry (—). 86. Stirling : Grangemouth (Miss Todd). Balmaha (Mackechnie). 87. W. Perth : Callander (Kidston). Strathyre (Groves). Loch Lubnaig (Buchanan-White). 106. E. Ross : Tain (Marshall).

var. *Brunkeri*.

Ireland.—13. Carlow : Borris (Praeger). 14. Leix : Maryborough (Praeger). Mountmellick (Phillips). 19. Kildare : Harristown (Phillips). 20. Wicklow : Glendalough (Praeger)! Poulaphouca, Meeting of the Waters, Glenmacnass and Lake Dan (Bruncker). 21. Dublin : Rathfarnham (Praeger).

General Distribution.—France. Switzerland. Germany. Central Europe.

240. *HIERACIUM PERPROPINQUUM* (Zahn) comb. nov.

H. sabaudum subsp. *sedunense* var. *perpropinquum* Zahn, l. c. 945 (1922); *H. boreale* subsp. *dumosum* micr. *propinquum* Sudre, Hier. Centr. Fr. 17 (1902); *H. boreale* subsp. *obliquum* var. *propinquum* Rouy, Fl. Fr. ix. 386 (1905); non *H. propinquum* Norrl.; *H. sabaudum* Smith, Eng. Bot. no. 349 (1796), non L. Sp. Pl. 804 (1753); *H. boreale* var. *Hervieri* W. R. Lint. Brit. Hier. 91 (1905), non *H. Hervieri* Arv.-Touv. in Bull. Soc. Dauph. ii. no. 376 (1891).

Icones.—Eng. Bot. t. 349 (E. B. ed. 3, 854); *Sudre* l. c. pl. ii.; Pl. 14, fig. b.

Exsicc.—*Sudre*, Hb. Hier. vi. 293, as *H. propinquum*; Linton no. 100 (Horton), as *H. boreale* var. *Hervieri*; Hanbury, Speldhurst, 1874, in Hb. Hanbury, as *H. boreale*; Pugsley, Wimbledon, 1898 and 1920, in Hb. Pugsley; Marshall no. 2259, in Hb. Mus. Brit.

Stem normally 50–100 cm. high, ±robust, sometimes slightly reddish about the base, *densely long-pilose* (–4 mm.) below or throughout with whitish, spreading, ±bulbous-based hairs. *Leaves* dull green, *paler beneath*, numerous, 25–40(–65), *heteromorphous*, often rather flaccid, sometimes crowded about the middle of the stem; the primordial oblong, obtuse-mucronulate, remotely denticulate, long-attenuate below to short, winged petioles, withering early; the lower long, *lanceolate to elliptic-lanceolate*, acuminate, *with a few fine spreading teeth or denticulations* about the middle, long-attenuate below but scarcely petiolate; median similar but shorter, with shortly contracted to rounded, semi-amplexicaul base; the upper becoming smaller, more acuminate and narrower with broad base; all ±*glabrescent* above, *pilose*, especially on the midrib, *beneath*, with ciliate margins. *Inflorescence* *paniculate-corymbose*, 12–25(–40)-headed, often *with long, slender, erect-spreading, leafy branches* from the upper leaf-axils, sometimes apically subumbellate, *branches and peduncles floccose*, and ±*densely pilose* with long, spreading hairs. *Heads* of medium size, rounded to subtruncate below and subtended by loose bracteoles. *Phyllaries* incumbent in bud, *dull or dark olive-green*, with ±*lighter margins*, linear-lanceolate, obtuse, effloccose, *with numerous long, flexuous, whitish pilose hairs* (chiefly below), mixed *with many finer simple and short, fine glandular hairs* or microglands. *Ligules* light yellow, glabrous-tipped. *Styles* dark livid. *Margins of receptacle-pits* *fibrillous-dentate*. Achenes blackish brown, 3–3.5 mm. long.

This species was described as a British plant by Smith in 'English Botany' (l. c.) from specimens collected at Thorpe, near Norwich, under the name of *H. sabaudum* L. Subsequently, after Fries had revised his *H. boreale*, and *H. sabaudum* L. was restricted to a different form with broader, coarsely toothed foliage, that is not known as a wild plant in Britain, it was treated by British botanists as *H. boreale* Fr. In W. R. Linton's 'British Hieracia' (l. c.) it is made a variety *Hervieri* of *H. boreale* and identified with *H. Hervieri* Arv.-Touv. (l. c.), a rare French plant, well represented in Herb. Mus. Brit., which has somewhat the facies of *H. perpropinquum* but differs essentially in its smaller flower-heads, raised, denticulate and not fibrillous-edged receptacle-pits, and light brown or fulvous achenes. *H. Hervieri* does not belong to the Section *Sabauda* and is commonly placed among the *Italica*. Linton sent out both this plant and *H. Bladonii* as var. *Hervieri*, and Zahn cites '*H. boreale* var. *Hervieri* Lint. Brit. Hier. 91' under *H. obliquum* (Jord.). But Zahn also shows *H. sedunense* var. *perpropinquum* (*H. propinquum* Sudre) as a British plant, distinguishing the variety by its more pilose peduncles and phyllaries. He appears to have seen specimens from the south of England. *Sudre* records it for Somerset.

H. perpropinquum is closely allied to the Swiss *H. sedunense* Grml., which differs in its more pilose foliage, and according to Zahn by its yellow styles. It has also been confused with *H. dumosum* Jord., which is closely related to *H. sabaudum* L. sensu stricto. Zahn gives *H. dumosum* (l. c.) for 'England, Kent', and as var. *Carionii* (Bor.) for 'Lancashire (coll. Miller!)'. Among the British material examined, however, no examples have been seen that can be referred to *H. dumosum*.

The present species is also allied to and not always readily separable from *H. Bladonii*, from which it differs in its lighter green, less markedly heteromorphous foliage, and its rather smaller heads, with generally lighter ligules and shorter, paler, less concolorous phyllaries, the indumentum whereof is predominately pilose rather than glandular.

In Britain *H. perpropinquum* is found chiefly on the light soils of the south and south-east of England.

Distribution.—4. N. Devon: South Molton (Druce). Tiverton (Still). 5. S. Somerset: Dulverton (Marshall). 7. N. Wilts: Savernake! 8. S. Wilts: Compton (Tatum). Blackslough (Grose). 9. Dorset: Horton (Linton). 11. S. Hants: Nurstead (Wallace). Lyndhurst (Rayner). 13. W. Sussex: Lurgashall (Burdon). Lodsworth (Barton). 14. E. Sussex: Forest Row (W. S. F.). 16. W. Kent: Sandridge (Lousley). Swanley (Groves). Speldhurst (Hanbury). 17. Surrey: Wimbledon! Witley (Hanbury). Redhill (Linnell). 18. S. Essex: Epping Forest! 22. Berks: Earleywood! 23. Oxford: Sibford (Biddelsdell). 26. W. Suffolk: Eriswell (Hanbury). 27. E. Norfolk: Thorpe (Smith). Parton (A. E. Ellis). 30. Bedford: Leighton Buzzard (Dony). 32. Northants: Easton Hornstocks (Fisher). 33. E. Glo'ster: Prestbury (Knight). 34. W. Glo'ster: Woodchester (Reader). 46. Cardigan: Newquay (Marshall). 55. Leicester: Quorn (Foord-Kelcey). 56. Notts: Newark (Fisher). 70. Cumberland: Derwentwater (Baker).

General Distribution.—France. Belgium.

241. *HIERACIUM ARGUTIFOLIUM* sp. nov.

H. commutatum × *Eupatorium*? Hanb. in Journ. Bot. xxxi. 16 (1893).

Exsicc.—Ley, Torpantau, 1892 (type), in Hb. Hanbury.

Caulis 50–90 cm. robustus, striatus, pilosus (praesertim basin versus), tandem facile scaberulus. *Folia* saturate viridia, 15–30, satis magna, firma, ± suberecta; inferiora rhomboideo-lanceolata, argute acuminata, utrinque dentibus paucis tenuibus acutissimis vel spinulosis, arrectis, nonnunquam serraturis minimis immixtis munita, circa medium latissima, inferne ad basin sessilem longe attenuata; media similia sed inferne brevius contracta; superiora anguste ovato-lanceolata, longe acuminata, dentibus paucis, tenuibus, argutis, arrectis, basi abrupte contractâ ± rotundatâ; omnia utrinque pilis basi bulbosis hirsuta vel superiora superne glabrescentia, marginibus scaberulis vel foliorum superiorum hinc inde ciliatis. *Anthela paniculato-corymbosa*, 6–20-cephala, ramis strictis ± foliatis suberectis e foliorum superiorum axillis; pedunculi floccosi pilis ± numerosis patentibus basi atris vestiti. *Involucra* magna, basi rotundata. *Squamae* (exteriores laxae) atrovirides, concolores, linearilanceolatae, obtusae, glandulis tenuibus ± densis et pilis longis albidis satis numerosis praesertim basin versus obsitae. Ligulae apice glabrae. Styli lividi. *Alveoli receptaculi* margine fibrilloso-dentati.

Stem 50–90 cm. high, robust, striate, pilose (especially below), readily becoming scaberulous. *Leaves* deep green, 15–30, rather large, firm, ± suberect; the lower rhombic-lanceolate, sharply acuminate, with a few fine, very sharp or spinulose, ascending teeth, sometimes interspersed with serrulations, on each side, broadest about the middle and long-attenuate below to a sessile base; median similar but more shortly contracted below; the upper narrowly ovate-lanceolate, long-acuminate, with a few fine, sharp, ascending teeth and an abruptly contracted, ± rounded base; all pilose on both surfaces with bulbous-based hairs or the upper glabrescent above, margins scaberulous or, in the lower leaves, intermittently ciliate. *Inflorescence* paniculate-corymbose, 6–20-headed, with strict, ± leafy, suberect branches from the upper leaf-axils; peduncles floccose, with ± numerous, spreading, dark-based pilose hairs. *Heads* large, rounded below. *Phyllaries* incumbent in bud, the outer lax, blackish green, concolorous, linear-lanceolate, obtuse, with ± dense, fine glandular hairs, and rather

numerous long, whitish pilose hairs chiefly towards the base. Ligules glabrous-tipped. Styles livid. Margins of receptacle-pits fibrillous-dentate. Achenes purplish black, 3.5–4 mm. long.

This plant was originally found by Ley in 1892 growing in large quantity on a hedgebank near Torpantau, in Brecon, in company with another form of this Section and with *H. Bartonii*. A few days later he collected the same plant at Rhayader, in Radnor. A good series from Torpantau was sent to Hanbury with a suggestion of the above-cited hybrid origin, and Hanbury, concurring in this, reported it early in the following year in the 'Journal of Botany' (vide supra). Ley again collected the plant at Torpantau in the summer of 1893, this time with *H. reticulatum*, and a third time in 1894. It has apparently escaped notice since that date.

There seems but little reason to suspect hybridity in this case beyond the fact that the plant was found growing at Torpantau with other species that might possibly have produced it. Its existence in a second habitat does not support the hybrid theory. The plant clearly belongs to the *Sabauda*, as is shown by its rough stem and foliage, its concolorous phyllaries, and its fibrillous-edged alveoles; and it is nearly related to *H. Bladonii*, whose flower-heads are very similar. Its sharply pointed, suberect foliage, with fine, almost spinulose serrations, is so distinct, however, that it can hardly be regarded as conspecific with *H. Bladonii*, and it is therefore described as a new species, *H. argutifolium*. A somewhat similar plant was collected by Mr. Barton near Bethesda in 1915 (nos. 170–1).

Distribution.—42. Brecon : Torpantau (Ley). 43. Radnor : Rhayader (Ley).

Endemic.

242. *HIERACIUM EMINENTIFORME* sp. nov.

Exsicc.—Pugsley no. 817 (type), in Hb. Pugsley; Marshall no. 3199, in Hb. Mus. Brit.

Caulis (30–)50–100 cm., \pm robustus, striatus, *inferne* \pm dense pilosus, *sursum* normaliter glabrescens, leviter floccosus. *Folia* laete viridia, numerosa, 30–60, saepe magna, satis conferta; inferiora elliptico-lanceolata, acuminata, dentibus paucis parvis patentibus argutis (nonnunquam curvatis) munita, in basin sessilem attenuata; media elliptico- ad ovato-lanceolata, acuminata, similiter vel grossius dentata, basi breviter cuneatâ ad latâ rotundatâ sessilia; summa late ovato-lanceolata, acuminata, dentibus paucis argutis inaequalibus, basi late rotundatâ sessilia; omnia superne glabrescentia (inferioribus interdum exceptis), *inferne* pilosa, marginibus sparsim ciliatis vel \pm obscure scaberulis. *Anthela* racemoso- ad paniculato-corymbosa, 10–30(–80)-cephala, saepissime ramis breviusculis suberectis e foliorum superiorum axillis. *Pedunculi* pilis sparsis (raro multis) floccosi. *Involucra* majuscula, basi rotundata. *Squamae* atrovirides, fere concolores numerosae (exteriores \pm sub-squarrosae), lineari-lanceolatae, obtusae, glandulis imparibus (saepius tenuibus) densis et normaliter, praesertim basin versus, pilis longis albidis solitariis ad multis vestita. Ligulae apice glabrae. Styli lividi. *Alveoli receptaculi* margine fibrilloso-dentati.

Stem (30–)50–100 cm. high, \pm robust, striate, \pm densely pilose below, becoming normally glabrescent and slightly floccose upwards. *Leaves* bright green, numerous, 30–60, often large and rather crowded; lower elliptic-lanceolate, acuminate, with a few small, spreading, sharp and sometimes curved teeth, attenuate below to a sessile base; median elliptic- to ovate-lanceolate, acuminate, with similar or much larger teeth, sessile with shortly cuneate to broad, rounded base; upper broadly ovate-lanceolate, acuminate, with a few sharp, unequal teeth and \pm broadly rounded, sessile base, all glabrescent above (except sometimes the lower) and pilose beneath, with sparingly ciliate or \pm obscurely scaberulous margins. *Inflorescence* racemose- to

paniculate-corymbose, 10-30(-80)-headed, normally with rather short, suberect branches from the upper leaf-axils; *peduncles floccose with a few* (rarely many) scattered *pilose hairs*. *Heads rather large*, rounded below. *Phyllaries* incumbent in bud, *blackish green, nearly concolorous*, numerous (the outer with \pm spreading tips), linear-lanceolate, obtuse, *clad with dense, unequal* (generally fine) *glandular hairs* and usually *few or many* long, whitish *pilose hairs* chiefly about the base. Ligules glabrous-tipped. Styles livid. *Margins of receptacle-pits fibrillous-dentate*. Achenes purplish black, about 4 mm. long.

This plant resembles *H. eminens* Sudre and the author's *exsiccata* Hb. Hier. ii. 98, sent out under the name *H. eminens* var. *nigriceps*. *H. eminens*, however, is characterized by almost wholly glandular involucre, and owing to the absence of pilose hairs it is placed in the group *Borealia* by Zahn (as subsp. *lugdunense* (Rouy)) rather than among the *Eu-Sabauda*. Sudre treats it as a microgène of *H. virgultorum* Jord. The British plant, as seen about Lynton, occasionally develops almost entirely glandular involucre, but more often these are also appreciably pilose. About Combe Martin the plants uniformly produce long pilose hairs among the involucral glands almost as freely as in *H. Bladonii* or *H. perpropinquum*, although otherwise they match the Lynton form. In view of these features this North Devon form is regarded as a new species distinct from *H. eminens* Sudre, and is included in the Series *Eu-Sabauda*. It is separable from *H. Bladonii* and *H. perpropinquum* by its less pilose stem and panicle, its broader leaves and its more densely glandular phyllaries. When well grown it is a handsome plant with fine foliage and more or less showy heads.

Distribution.—4. N. Devon: Lynton! Woodabay! Combe Martin! Ilfracombe (F. J. Hort). 5. S. Somerset: Culbone (Marshall). 41. Glamorgan: Radyr (Riddelsdell).

Endemic.

Series **Borealia**. (See page 299.)

243. *HIERACIUM VIRGULTORUM* Jordan, Cat. Dijon, 24 (1848).

H. boreale subsp. *virgultorum* Sudre, Hier. Centr. Fr. 21 (1902); Rouy, Fl. Fr. ix. 387 (1905); *H. sabaudum* subsp. *virgultorum* Schinz and Keller, Fl. Schweiz, ed. 2, ii. 344 (1905); Zahn, l. c. 949 (1922).

Icones.—Sudre, l. c. pl. iv.; Zahn, l. c. fig. 67 C₁ and C₂.

Exsicc.—Sudre, Hb. Hier. ii. 96; Druce, Stoke Pogis, 1900, in Hb. Mus. Brit. as *H. boreale* var. *Hervieri*; Pugsley no. 595, in Hb. Pugsley.

Stem 50-100 cm. high, \pm slender, finely striate, *pilose below*, becoming \pm *glabrescent in the upper half*. *Leaves usually bright green*, numerous, 20-40, narrow, often \pm flaccid, diminishing from the base upwards; the *lower long-lanceolate*, acuminate, with *distant denticulations* (more rarely finely dentate), long-attenuate below; *median lanceolate*, acuminate, similarly toothed, with *cuneate to narrow, rounded base*; upper narrowly ovate-lanceolate, long-acuminate, denticulate, sessile with rounded base; all *glabrescent above, sparingly pilose beneath* (chiefly on the midrib) with \pm ciliate or scaberulous margins. *Inflorescence paniculate-corymbose*, 10-50-headed, with *slender, suberect branches* from the uppermost leaf-axils; *peduncles slender, moderately floccose*, sometimes with occasional spreading pilose hairs. *Heads rather small to medium sized*, rounded below. *Phyllaries* incumbent in bud, *dull or dark olive-green, nearly concolorous*, linear-lanceolate, obtuse, with *scattered to dense fine glandular hairs* or microglands, often with some solitary pilose hairs intermixed. Ligules glabrous-tipped. Styles livid. *Margins of receptacle-pits fibrillous-dentate*. Achenes purplish black, 3.5-4 mm. long.

H. virgultorum differs from the foregoing species of the *Sabauda* by its slenderer and more glabrous habit, with narrower foliage and normally smaller heads with an indumentum almost wholly glandular. As a variety of *H. boreale*, it is given for

Harrow Weald Common, Middlesex, by W. R. Linton, but this is transferred by Zahn to *H. nemorivagum* Jord. The specimen, which Zahn does not appear to have seen, seems referable to *H. rigens* Jord. Zahn refers to *H. virgultorum* the English and Welsh plants identified with *H. rigens* by W. R. Linton, but of the specimens seen from the localities cited only one appears to be *H. virgultorum*, the remainder being *H. Bladonii* or *H. vagum* Jord. Zahn also cites 'Scotland : Aberdeen !' for *H. virgultorum*, the specimen which he saw being probably one of the set collected by Syme in 1879 at Kingcausie, on the Dee, of which there are many examples in herbaria. This plant has somewhat the facies of *H. virgultorum* but its involucre are eglandular and it appears to be a form of *H. sublactucaceum* Zahn.

H. virgultorum is seemingly a rare plant in Britain. I have seen it in two separate stations near Tunbridge Wells, only in small quantity, and have examined adequate specimens from only three other counties. An example collected by Borrer in 1810 near Lanark may also be referable to it but is hardly sufficient for certainty.

Distribution.—11. S. Hants : Bournemouth (Linton). 14. E. Sussex : Broadwater Forest ! 16. W. Kent : Tunbridge Wells ! 21. Middlesex : Northwood (Mrs. Welch). Harefield (Kent). 24. Bucks : Stoke Pogis (Druce).

General Distribution.—Spain. France. Central Europe to Russia.

244. *HIERACIUM RIGENS* Jordan, Cat. Grenoble, 20 (1849).

H. boreale subsp. *virgultorum* var. *rigens* Sudre, Hier. Centr. Fr. 22 (1902) ; Rouy, Fl. Fr. ix. 388 (1905) ; *H. sabaudum* subsp. *virgultorum* var. *rigens* Schinz and Keller, Fl. Schweiz, ed. 2, ii. 344 (1905) ; *H. boreale* var. *virgultorum* W. R. Lint. Brit. Hier. 91 (1905) ; *H. sabaudum* subsp. *rigens* Zahn, l. c. 950 (1922).

Icon.—Sudre, l. c. pl. iv.

Exsicc.—Jordan, Lyon, 1852, in Hb. Kew : Pugsley no. 818, in Hb. Pugsley ; Standen, Lindfield, 1912, in Hb. Mus. Brit. as *H. boreale*.

Stem 50–100 cm. high, erect ± slender, striate, generally tinted with purplish, ± pilose or scaberulous below, normally becoming glabrescent in the upper half. *Leaves* dark green, paler beneath, numerous (20–50), firm, relatively small, diminishing from the base of the stem upwards and rarely crowded about the middle ; the lower lanceolate, acuminate, with fine, sharp, distant, ascending teeth or serrulations, long-attenuate below but scarcely petiolate ; median lanceolate, acuminate, finely, sharply and unequally serrate, sessile with shortly cuneate or scarcely rounded base ; upper ovate-lanceolate, acuminate, ± serrulate, with ± rounded base ; all glabrescent above, sparsely pilose (the upper rarely also ± floccose) beneath, with slightly ciliate or scaberulous margins. *Inflorescence* racemose- to paniculate-corymbose, 10–40(–100)-headed, with ± numerous long, slender, suberect, strict (sometimes compound), slightly leafy branches from the upper leaf-axils ; peduncles slender, ± floccose, with occasional dark, spreading pilose hairs. *Heads* of medium size or rather small, rounded below. *Phyllaries* incumbent in bud, dark olive- or blackish green, scarcely concolorous, linear-lanceolate, obtuse, with ± dense, fine glandular hairs or microglands, and occasionally a few longer pilose hairs intermixed. *Ligules* glabrous-tipped. *Styles* livid. *Margins of receptacle-pits* fibrillous-dentate. *Achenes* purplish black, about 4 mm. long.

H. rigens is closely allied to *H. virgultorum*, of which it is treated as a variety by Sudre and Rouy. It differs in its more rigid and sometimes more robust habit, its dark, firm and unequally toothed foliage and its darker phyllaries ; and Zahn is therefore followed in keeping the two Jordanian plants distinct. As a variety of *H. boreale*, *H. rigens* is recorded for several British stations by W. R. Linton (l. c.), which are transferred to *H. virgultorum* by Zahn (vide supra).

In Britain *H. rigens* seems nearly confined to the south of England and may be a recent introduction in some of its habitats.

Another plant with narrow, strongly toothed leaves, *H. nemorivagum* Jord., is cited by Zahn for Middlesex and by Roffey (in London Catalogue) for eight British vice-counties. This name first appears in Boreau's Fl. Centr. Fr. (1857), as an 'Obs.' appended to the description of *H. curvidens* Jord. Cat. Gren. 18 (1849), and the plant seems never to have been formally described as a species either by Jordan or Boreau. Sudre (l. c.) treats it as *H. dispalatum* Jord. var. *nemorivagum* Sudre, giving a description which indicates a form resembling in some respects Jordan's *H. curvidens*. Zahn maintains *H. nemorivagum* Jord. ex Bor. and *H. curvidens* Jord. as separate subspecies. No British specimens have been seen that match the accounts of *H. nemorivagum*, but a form that recalls *H. curvidens* Jord., except for its yellow styles, grows in some quantity on Putney Heath in Surrey. After further observation, this should perhaps be distinguished as a new species.

Distribution.—11. S. Hants: Bitterne (Rayner). 12. N. Hants: Church Crookham (R. H. Hall). 13. W. Sussex: Selham (Lacaita). 14. E. Sussex: Lindfield (Standen). 16. W. Kent: Plumstead (Wolley-Dod). 17. Surrey: Wimbledon! Leith Hill! Pirbright! Chobham! 19. N. Essex: Berechurch (Brown). 21. Middlesex: Harrow Weald (W. R. Linton). 24. Bucks: Burnham Beeches! 30. Bedford: Clophill (Dony). 34. W. Glo'ster: Cinderford (Day). 51. Flint: Caerwys (Parsons).

General Distribution.—France. Switzerland. Central Europe.

245. *HIERACIUM VAGUM* Jordan, Cat. Grenoble, 21 (1849); Boreau, Fl. Centr. Fr. ed. 3, ii. 388 (1857); *H. boreale* subsp. *virgultorum* micr. *vagum* Sudre, Hier. Centr. Fr. 27 (1902); *H. boreale* subsp. *vagum* Rouy, Fl. Fr. ix. 392 (1905); *H. sabaudum* subsp. *vagum* Schinz and Keller, Fl. Schweiz, ed. 2, ii. 344 (1905); Zahn, l. c. 953 (1922); *H. boreale* Fries, Epicr. 130 (1862), ex parte; *H. sabaudum* Williams, l. c. 175 (1903), excl. vars.?

Icones.—Sudre, l. c. pl. v.; Zahn, l. c. fig. 67 F.

Exsicc.—Jordan, Mayres, 1849, in Hb. Kew; Fries, Hier. Eur. no. 150, as *H. boreale*; Ley, Llanguris, 1893, and Fox, Grasmere, 1888, both in Hb. Hanbury as *H. boreale*; Westcombe, Bewdley, in Hb. Backhouse as *H. boreale*; Linton, no. 49 (Yeldersley) as *H. boreale*.

Stem (30–)50–80(–100) cm. high, normally robust, *pilose* (sometimes densely) *below*, usually becoming glabrescent in the upper half. *Leaves* *deep green*, strongly nerved, numerous (20–40(–70)), occasionally crowded near the middle of the stem with the upper much smaller, *firm*, all but the lower \pm *suberect*; lower oval to elliptic, subacute, with distant, shallow, ascending teeth, \pm long-attenuate below but sessile; median *oval to ovate-elliptic*, subacuminate, \pm *remotely serrate* (sometimes with curved teeth), sessile with \pm *rounded base*; upper elliptic-lanceolate to broadly ovate-elliptic, acuminate, finely serrate, with broadly rounded, sessile base; all *glabrescent above*, *sparsely pilose* (chiefly on the midrib) and the upper sometimes \pm *floccose beneath*, with ciliate or scaberulous margins. *Inflorescence* racemose- to *paniculate-corymbose*, 10–40(–100)-headed, *often compact with short, suberect branches*, sometimes more compound with longer branches from the upper leaf-axils; *peduncles floccose*, sometimes also with *scattered* or solitary (rarely numerous) *pilose hairs*. *Heads* \pm *large*, subtruncate-based, very rarely stylose-flowered. *Phyllaries* incumbent in bud, *blackish green, concolorous*, numerous (the outer \pm *lax*), rather broad, linear-lanceolate, very obtuse, *glabrescent*, but sometimes with *slight scattered floccum* along the margins or over the surfaces of the outer phyllaries, or even a few *pilose hairs, eglandular*. Ligules glabrous-tipped. Styles livid. *Margins of receptacle-pits fibrillose-dentate*. Achenes purplish black, about 3.5 mm. long.

H. vagum, as generally understood by modern Continental botanists, is a distinct species that differs clearly from the previously described members of this Section by its less hirsute though vigorous habit, with generally rather broad, more or less suberect foliage, usually compact panicle, and blackish, glabrescent phyllaries on which both pilose and glandular hairs are normally wanting.

In his original account Jordan describes the phyllaries as green with paler margins, but this character is not maintained by most later writers. The sheet from Jordan at Kew scarcely represents the usual form of the species, being of slender habit with rather narrow leaves, and heads showing an appreciable amount of floccose hair on the phyllaries. *H. vagum* agrees with Fries's description of *H. boreale* (l. c.) more closely than does any other British member of this group, and his specimen cited above (from Bohemia) very fairly represents the species as commonly seen in Britain, which seems generally to approach the variety *subrectum* Sudre (*H. subrectum* Jord. ex Boreau, l. c. 387).

H. vagum is given for 'S. England' by Zahn, but he has apparently seen no British specimens. It actually has a more northern distribution in Britain than the foregoing species and is chiefly characteristic of the midlands and north of England, and of Wales. It is recorded for Lancashire by Sudre.

Distribution.—20. Herts : Boxmoor (Benson). 24. Bucks : Denham (Roffey). 30. Bedford : Legrave (Dony). 32. Northants : Kingscliffe (Carter). 36. Hereford : Haugh and Bolston Woods (Ley). 37. Worcester : Bewdley (Westcombe). Wyre Forest (Ley). 39. Staffs : Knypersley (Painter). 40. Shropshire : Ironbridge (Beckwith). Shrewsbury (Leighton). Cleobury Mortimer (Ley). 42. Brecon : Erwood (Ley). 43. Radnor : Aberedw (Ley). Boughrood (Druce). 44. Carmarthen : Nant Mwyn (Ley). 45. Pembroke : Cilgerran (Ridley). 46. Cardigan : Glandovey (Percival). 47. Montgomery : Llanguris (Ley). Llanfyllin (Whitwell). 48. Merioneth : Tyn y Groes (Barton). Dolgelly (Moyle Rogers). 49. Carnarvon : Llanfairfechan ! Menai Strait (J. Ball). Bettws-y-Coed (Bailey) ! Llanberis (Hume). Bethesda ! Great Ormes Head (Griffiths). 50. Denbigh : Conway Falls ! 51. Flint : Hawarden (Ley). 53. S. Lincs : Skellingthorpe (Fisher). 54. N. Lincs : Boston (Alston). 55. Leicester : Newtown Linford (A. B. Jackson). 56. Notts : Newton and Tuxford (Fisher). 57. Derby : Pleasley (Fisher). Yeldersley (W. R. Linton). Dovedale (Purchas). Chatsworth (Lacaita). 58. Cheshire : Macclesfield and Bollington (Marshall). Mobberley (—). 59. S. Lincs : Gisburn (F. P. Thompson). Walton (Wheldon). Manchester (Grindon). 61. S.E. Yorks : Hull (Miss Todd). Rievaulx (A. B. Hall). 62. N.E. Yorks : Langwith (Backhouse). Castle Howard (Ibbetson). Thirsk and Ayton (Baker). 63. S.W. Yorks : Armley (Foster). Huddersfield (Backhouse). Sheffield (J. Brown). 64. M.W. Yorks : Ingleborough (Cotton). Mirfield (Riddelsdell). 65. N.W. Yorks : Sedbergh (Lees). Dent Dale (Oliver). 66. Durham : Durham (Fox). 69. Westmorland etc. : Grasmere (Fox). Coniston (Mennell). 70. Cumberland : Derwentwater (Baker). Keswick (Hort). Portinscale (Bailey). 71. Man : Laxey (Whellan). 75. Ayr : Ballantrae (Fullerton). 83. Edinburgh : Calton Hill (Taylor). 90. Forfar : Forfar and Glamis (Corstorphine). 95. Elgin : Dumphail (Marshall).

General Distribution.—Spain. France. Switzerland. Central Europe.

246. *HIERACIUM SUBLACTUCACEUM* (Zahn) Druce in Bot. Exchange Club (B.I.) Report, ix. pt. v. 562 (1932); *H. sabaudum* subsp. *sublactucaceum* Zahn in Koch, Syn. ed. 3, iii. 1917 (1901); Schinz and Keller, Fl. Schweiz, ed. 2, ii. 345 (1905); Zahn, Mon. 954 (1922).

Icon.—Zahn, l. c. fig. 67 E.

Exsicc.—Druce, Boughrood, 1931, in Hb. Druce.

Stem 50–100 cm. high, rather slender, *pilose towards the base*, less so or glabrescent upwards. *Leaves* pale green, glaucescent beneath, thin, numerous (about 30), diminishing from the base upwards; lower long, lanceolate, acuminate, with a few distant, sharp teeth or denticulations, very long-attenuate below, subpetiolate; median lanceolate to narrowly ovate-lanceolate, acuminate, with a few unequal, sharp teeth, shortly contracted or slightly rounded below, sessile; upper small, narrowly ovate-lanceolate, long-acuminate, sharply toothed towards the rounded, sessile base; all glabrescent above, sparingly pilose beneath (the upper also \pm floccose), with \pm ciliate margins. *Inflorescence* compactly paniculate-corymbose, 3–15(–25)-headed, sometimes with short, suberect branches from the upper leaf-axils, peduncles floccose. *Heads* of medium size to rather large, rounded below. *Phyllaries* incumbent in bud, blackish green, concolorous, linear-lanceolate, obtuse, glabrescent, sometimes obscurely floccose about the base or with some solitary pilose or fine glandular hairs. *Ligules* glabrous-tipped. *Styles* livid. *Margins of receptacle-pits* fibrillous-dentate. *Achenes* purplish black, about 3.5 mm. long.

The inclusion of this plant in the British list is chiefly based on Zahn's identification and description (with a varietal name added) of a specimen sent him from Boughrood, Radnor, by G. C. Druce in 1931. It is evidently closely allied to *H. vagum*, from which it seems to differ mainly in its narrower and thinner foliage, of a paler tint of green. This may be due, at least in part, to environment. A similar plant was obtained by Mr. W. C. Barton at Dolgelly. Further Welsh specimens that I have collected at Llanberis seem identical with *H. sublactucaceum*, as may likewise be a plant from Marshbrook, in Shropshire, distributed by Ley through the two Botanical Exchange Clubs in 1909. Mr. Lousley obtained a plant on railway sidings at Burton-on-Trent in 1936 closely resembling the last-named. There are also slender specimens, collected by Syme and Beeby in Aberdeenshire and now in Herb. Mus. Brit. and Herb. Hanbury, that seem to belong here.

Zahn gives *H. sublactucaceum* as a plant of central Europe and does not include France within its area. Sudre's *exsiccata* bearing this name (Hb. Hier. iv. 197) from Puy-de-Dôme (1914) looks widely different from our Radnor plant and from Zahn's description.

H. sublactucaceum requires further investigation in this country to establish its distinctness from *H. vagum*.

Distribution.—40. Shropshire: Marshbrook (Ley). 43. Radnor: Boughrood (Druce). 48. Merioneth: Dolgelly (Barton). 49. Carnarvon: Llanberis! 92. S. Aberdeen: Kingcausie (Syme). Aberdeen Links (Beeby).

General Distribution.—Germany. Switzerland. Austria. Bosnia. Transcaucasia. France ?

247. *HIERACIUM CALVATUM* (F. J. Hanbury) Pugsley in Journ. Ecol. xxxiii. 347 (1946).

H. boreale var. *calvatum* Hanb. in Journ. Bot. xxxii. 232 (1894); Williams, l. c. 177 (1903); Hanb. in Bab. Man. ed. 9, 268 (1904); W. R. Lint. Brit. Hier. 91 (1905); *H. sabaudum* subsp. *nemorivagum* var. *sparsicilium* f. *calvatum* Zahn, l. c. 951 (1922).

Exsicc.—Ley, Llugwy River, 1888 (type), in Hb. Hanbury.

Generally *pseudophyllopodous*. *Stem* 30–60 cm. high, rather robust, *pilose below*, glabrescent or slightly scaberulous above. *Leaves* deep green, 10–20, firm, \pm suberect: the lower, usually crowded near the base of the stem, lanceolate to elliptic-lanceolate, acute, with a few distant, ascending teeth or serrulations, \pm shortly attenuate below to a sessile base; median elliptic-lanceolate (rarely lanceolate), acute to acuminate, with distant (sometimes very few) ascending teeth or serrulations, sessile with abruptly contracted or rounded base; upper ovate-lanceolate, acuminate, sparingly toothed, with sessile, \pm rounded base; all generally glabrescent above and \pm pilose (or the upper glabrescent) beneath, with margins scaberulous or, of the

lower leaves, sometimes sparsely ciliate. *Inflorescence* paniculate-corymbose, 5–20-headed, with rather long, erect-spreading, \pm floccose branches and peduncles. *Heads* large, subtruncate-based. *Phyllaries* incumbent in bud, blackish green, concolorous, numerous, linear-lanceolate, obtuse, nearly glabrous. *Ligules* glabrous-tipped. *Styles* dark livid. *Margins of receptacle-pits* fibrillose-dentate. *Achenes* purplish black, about 3.5 mm. long.

This neat and rather handsome hawkweed is remarkable for its pseudophyllopodous and relatively low habit of growth. It is evidently allied to *H. vagum*, which it sometimes resembles in foliage as well as in its black and almost naked involucre.

It is one of the many Welsh species discovered by Ley, who first found it in 1887 near Lake Ogwen, in Carnarvonshire, and the following year in much better condition by the river Llugwy. Specimens were referred to Hanbury, and to Lindeberg, who thought it a new species. In 1892 Ley met with it again on a river bank near Nant Gwylt, in Brecon, and near Cwm Elan, in Radnor.

Distribution.—42. Brecon : Nant Gwylt (Ley). 43. Radnor : Cwm Elan (Ley). 49. Carnarvon : Lake Ogwen, Llugwy valley and Nant Francon (Ley).

Endemic.

248. *HIERACIUM CROCEOSTYLUM* sp. nov.

Exsicc.—Pugsley no. 819 (type), in Hb. Pugsley.

Caulis 40–100 cm., robustus, basin versus pilosus (interdum dense), sursum glabrescens vel sparsim floccosus. *Folia* saturate viridia, inferne pallidiora, valde venosa, numerosa (20–40), firma, summa vulgo conspicue minora haud latiora; inferiora lanceolata ad elliptico-lanceolata, acuta ad acuminata, dentibus \pm remotis arrectis vel rarius denticulis praesertim in dimidio inferiore munita, inferne in basin sessilem \pm longe attenuata; media elliptico- ad ovato-lanceolata, acuminata, dentibus paucis argutis saepius tenuibus, inferne in basin sessilem lute cuneatam vel leviter rotundatam breviter angustata (rarius angustiora, oblongo-lanceolata, denticulata, basi breviter cuneata); superiora parva, ovato-lanceolata ad lanceolata, acuminata, parce dentata ad integra, sessilia, basi late cuneata ad leviter rotundata; omnia superne glabrescentia, inferne parce pilosa vel glabrescentia (summa etiam \pm floccosa) marginibus superiorum scaberulis inferiorum scaberulis rarius paulo ciliatis. *Anthela* compacte racemosa- ad paniculato-corymbosa, 10–30-cephala, ramis suberectis et nonnunquam e foliorum superiorum axillis brevioribus ut anthela \pm fastigiata fiat; pedunculi floccosi. *Involucrea* magna, inferne rotundata. *Squamae* atrovirides, concolores, numerosae, lineari-lanceolatae, obtusae, glabrae vel exteriores paululum floccosae. *Ligulae* apice glabrae. *Styli* lutei vel crocei. *Alveoli receptaculi* margine fibrilloso-dentati.

Stem 40–100 cm. high, robust, pilose (sometimes densely) towards the base, glabrescent or slightly floccose above. *Leaves* deep green, paler beneath, strongly veined, numerous (20–40), firm, the upper generally conspicuously smaller and not broader; lower lanceolate to elliptic-lanceolate, acute to acuminate, with \pm distant, ascending teeth or, more rarely, denticulations chiefly in the lower half, \pm long-attenuate below to a sessile base; median elliptic- to ovate-lanceolate, acuminate, with a few (generally fine) sharp teeth, shortly contracted below to a broadly cuneate or slightly rounded, sessile base (rarely narrower, oblong-lanceolate, denticulate, with shortly cuneate base); upper small, ovate-lanceolate to lanceolate, acuminate, sparingly toothed to entire, sessile with broadly cuneate to slightly rounded base; all glabrescent above, sparingly pilose or glabrescent (the upper also \pm floccose) beneath; margins of the upper scaberulous, of the lower scaberulous or more rarely slightly ciliate. *Inflorescence* compactly racemose- to paniculate-corymbose, \pm subfastigiata, 10–30-headed, with suberect branches and sometimes shorter lower ones from the upper

leaf-axils; *peduncles floccose*. Heads large, rounded below. *Phyllaries* incumbent in bud, *blackish green, concolorous*, numerous, linear-lanceolate, obtuse, *glabrous* or the outer with a little scattered *floccose hair*. Ligules glabrous-tipped. *Styles yellow or orange*. Margins of receptacle-pits *fibrillous-dentate*. Achenes purplish black, about 3.5 mm. long.

This fine plant falls within the small group of yellow-styled species of *Sabauda* in which Zahn includes *H. auratum* Fr. *H. auratum* is regarded by Zahn as identical with *H. quercetorum* Jord., which differs from the present plant by its much broader, coarsely toothed leaves and its smaller, paler heads with glandular or microglandular phyllaries. It is well shown in the *exsiccata* Sudre, Herb. Hier. iii. 143. Another plant with yellow styles is *H. praticolum* Sudre, represented by Sudre, Herb. Hier. vii. 343. This, according to Sudre's specimen, more closely resembles the British plant, especially in its foliar characters, but it differs in its broad-based upper leaves, and in its paler, narrower phyllaries. No other forms of this group with yellow styles are apparently known, and the British plant, well marked by its small and relatively narrow upper leaves, its compact and sometimes almost fastigate panicle, and its dark, glabrous involucre with yellow-styled florets, is therefore described as a new species *H. croceostylum*.

I collected a good series of this plant near Bethesda, Carnarvonshire, in September, 1902, which has hitherto remained unnamed in my herbarium. In 1924 I met with it near Minfordd Junction, in Merioneth, and Mr. Lousley obtained it at Maentwrog, in the same vicinity, in 1935. It also occurs near Bangor. In 1943 I found it again sparingly near Pandy Mill.

It appears to have also been collected by Linton at Morfa Bychan, Carnarvon, in 1893, and sent to Dahlstedt, who reported that it agreed with plants received from Upsala and named *H. auratum* by Fries. Cultivated specimens of this plant were subsequently utilized, with others of a different nature and origin, for Linton's set no. 159, as *H. umbellatum* f. *latifolia*. There are two sheets of this set in Herb. Mus. Brit. that agree with *H. croceostylum* except for their smaller flower-heads, the frequent result of cultivation.

Distribution.—48. Merioneth: Minfordd (Barton)! Maentwrog (Lousley). 49. Carnarvon: Morfa Bychan (Linton). Bethesda! Bangor (Griffiths). Pandy Mill!

Endemic.

249. *HIERACIUM SUBQUERCETORUM* sp. nov.

Exsicc.—Marshall no. 3876, in Hb. Mus. Brit.

Caulis 30–60 cm., *robustus*, inferne dense sursum minus *pilosus*, \pm *floccosus*. *Folia* obscure *viridia*, satis conferta (15–25), firma, acladium versus sensim minora; inferiora elliptico-lanceolata, acuminata, dentibus remotis satis parvis, inferne breviter attenuata, sessilia; *media lata, subrotundo-ovata ad ovato-lanceolata*, in apicem acuminatum abrupte contracta, *inaequaliter dentata, basi rotundatâ ad subcordatâ* sessilia; superiora parva, ovato-lanceolata, acuminata, remote dentata, ad basin latam rotundatam contracta, sessilia, saepe apice contorta; omnia *superne glabrescentia, inferne pilosa*, superiorum marginibus scaberulis inferiorum scaberulis ciliatisque. *Anthela compacte racemoso-corymbosa*, 20–25-cephala, *ramis brevibus subrectis* e foliorum superiorum axillis; *pedunculi floccosi leviter pilosi*. *Involucra mediocria*, basi rotundata. *Squamae atrovirides, concolores*, appressae, lineari-lanceolatae, obtusae, *glabrae* aut exteriores sparsim floccosae vel pilis paucis solitariis vestitae. Ligulae apice glabrae. *Styli laete lutei*. *Alveoli receptaculi margine fibrilloso-dentati*.

Stem 30–60 cm. high, *robust, densely pilose* below, becoming less so upwards, \pm *floccose*. *Leaves dull green*, rather crowded (15–25), *firm*, gradually decreasing upwards: lower elliptic-lanceolate, acuminate, with rather fine, distant teeth,

shortly attenuate below and sessile ; *median broad, subrotund-ovate to ovate-lanceolate, ± abruptly contracted to an acuminate apex, unequally toothed, with rounded to subcordate, sessile base* ; upper small, ovate-lanceolate, acuminate, distantly dentate, with broad, rounded base, often apically twisted ; all *glabrescent above, pilose beneath*, the upper with scaberulous, the lower with scaberulous and ciliate margins. *Inflorescence compactly racemose-corymbose, 20–25-headed, with short, suberect branches from the upper leaf-axils ; peduncles floccose and slightly pilose. Heads of medium size, rounded below. Phyllaries incumbent in bud, blackish green, concolorous, appressed, linear-lanceolate, obtuse, glabrous, or the outer sparingly floccose or with a few solitary pilose hairs. Ligules glabrous-tipped. Styles pure yellow. Margins of receptacle-pits fibrillose-dentate. Achenes*

This plant resembles *H. quercetorum* Jord. but is readily distinguished by its more hirsute stem and foliage, and by the absence of glands from the phyllaries. Its pilose and relatively dwarf habit, and broad, subcordate median leaves likewise separate it from *H. croceostylum*, which, judging by the material available for examination, has also much larger flower-heads.

H. subquercetorum was collected by E. S. Marshall in 1913 on dry banks at Gowdall, near Snaith, south-west Yorks, where he found it locally plentiful.

Distribution.—63. S.W. Yorks : Snaith (Marshall).

Endemic.

PILOSELLA S. F. Gray. (See page 33.)

A. *ACAULIA* NP. (See page 34.)

Section XIV. PILOSELLINA.

Fries, *Epicr.* 5 and 10 (1862) ; Naegeli and Peter, *Hier. Mitt.-Eur.* i. 114 (1885) ; Williams, l. c. 77 (1902) ; W. R. Linton, *Brit. Hier.* 1 (1905) ; Rouy, l. c. ix. 236 (1905) ; Zahn, l. c. 1148 (1923).

Dwarf, stoloniferous plants, with solitary or few single-headed, leafless scapes from the basal rosettes. Leaves generally spreading, lanceolate to obovate, entire to subdenticulate, green or glaucescent with long setose hairs above, paler and tomentose with softer pilose hairs beneath. Scapes floccose, varyingly glandular and pilose. Heads rather small to rather large, with obtuse to acuminate, ± floccose, glandular and pilose phyllaries. Ligules light yellow, the outer usually striped with red externally. Styles yellow. Margins of receptacle-pits dentate. Achenes purplish black, 2–2.5 mm. long.

Flowering May–July, and sometimes later.

This Section, the distribution of which coincides with that of the sub-genus, is represented in Britain by two species only, the widely spread *H. Pilosella* L., which is recorded for every vice-county but one of these islands, and *H. Peleterianum* Mérat, a comparatively rare plant occurring in a few stations from south-western England to Wales and the west Midlands, and commoner in the Channel Islands.

Stolons short and thick. Leaves oblong to elliptic, densely long-pilose.

Phyllaries broad-based, acuminate *H. Peleterianum*.

Stolons long and prostrate. Leaves lanceolate to elliptic, less pilose.

Phyllaries narrow to rather broad, ± acute *H. Pilosella*.

250. *HIERACIUM PELETERIANUM* Mérat, *Nouv. Fl. Paris*, ed. 1, 305 (1812) ; Naegeli and Peter, *Hier. Mitt.-Eur.* i. 127 (1885) ; Williams, l. c. 91 (1902) ; W. R. Lint. *Brit. Hier.* 9 (1905) ; Zahn, l. c. 1156 (1923) ; *H. Pilosella* var. *pilosissimum* Fries, *Symb.* 3 (1848) ; *Epicr.* 12 (1862) ; Syme, *Eng. Bot.* ed. 3, v. 165 (1866) ; Hanb. *Ill. Mon.* 3 (1889) ; in *Bab. Man.* ed. 9, 232 (1904).

Exsicc.—Linton no. 76 (Guernsey); Hier. Naegelianiana no. 3; Lindbg. H. Sc. i. 2 (ex parte); all in Hb. Mus. Brit.; Pugsley, St. Aubin's, Jersey, 1914, in Hb. Pugsley.

Rootstock thick, producing short, curved, very-long-pilose (–15 mm.), *leafy stolons*. Scape 1-headed, solitary or more often several (–10) lateral from the axils of the rosette-leaves, 10–20 cm. high, with 1–2 fine, linear bracts, usually densely floccose and finely glandular almost to the base, and \pm pilose with spreading hairs. *Leaves deep green, whitish grey beneath, lanceolate or oblanceolate to elliptic*, obtuse-mucronate to acute, entire, long-attenuate below, *densely long-pilose on the upper surface with stiff, shining, whitish setae*, which become longer and often exceed 10 mm. towards the leaf-base, the *lower surface* densely floccose or *tomentose*, usually also \pm pilose, especially along the midrib; leaves of the stolons more attenuate below, sometimes becoming lanceolate-spathulate. *Heads solitary, rather large and broad* (phyllaries about 12 mm. long), rounded below. *Phyllaries* incumbent in bud, greyish green (the inner often rosy-tipped), *linear-lanceolate with a broad base, acuminate* (the inner finely so and slightly senescent), *densely long-pilose* (3–4 mm.) with shining, whitish, black-based hairs, *almost eglandular and efloccose*. *Ligules* light yellow and, at least the outer, *strongly marked with red on the back*. Styles yellow. Margins of receptacle-pits shortly dentate. Achenes purplish black, about 2.5 mm. long.

β . tenuiscapum var. nov.

Icones.—Hanb. Ill. Mon. pl. 2; Pl. 15 fig. a.

Exsicc.—Barton, Blanches Banques, Jersey, 1923 (type); Wilmott nos. 4017 and 4018; all in Hb. Mus. Brit.; Purchas and Ley, Alstonfield, 1877, in Hb. Hanbury.

Rhizoma stolonibus laxioribus gracilius. Folia pallide viridia inferne albida, lineari-oblonga vel lineari-lanceolata, saepe inferne longissime attenuata, quam in typo minus pilosa. Scapus altior (–30 cm.) *graciliorque. Involucra mediocria ad satis parva, haud lata, inferne vix rotundata.*

Rootstock slenderer with laxer stolons. Leaves pale green, whitish beneath, linear-oblong or linear-lanceolate, often very-long-attenuate below, less pilose than in the type. Scape taller (–30 cm. high) and more slender. Heads of medium size to rather small, not broad and scarcely rounded below.

This beautiful hawkweed occurs in Britain in two very distinct forms. The typical species, with rather broad leaves, short scapes and large heads, seems to be plentiful in Guernsey, and occurs as a rare plant in Jersey and a few English and Welsh counties. The variety *tenuiscapum*, with long, narrow leaves, tall, slender scapes and smaller heads, appears to be absent from Guernsey but commoner than the type in Jersey. It grows also with the type in Derbyshire, and in an adjacent part of Staffordshire, where the type is unknown.

A series of cultivated specimens, stated to be of Dovedale origin and grown in 1905, was distributed by Ley through the Botanical Exchange Club (B.I.). The set is a mixture, for it includes several sheets of *H. Hoppeanum* Schultes, which are almost certainly of Alpine and not British origin. The plants are readily separable by their broadly subspathulate leaves and large heads with very broad and obtuse phyllaries.

Plants collected by Mr. Wilmott near Jubilee Hill road, Jersey, in 1933 (nos. 4003–4005) have the aspect of *H. Peleterianum* var. *tenuiscapum* \times *H. Pilosella* var. *concinatum*.

Distribution.—2. E. Cornwall: Wadebridge (Mrs. Wedgwood). 10. Wight: Freshwater (Stratton). 47. Montgomery: Craig Breidden (How). 49. Merioneth: Barmouth (How). 57. Derby: Dovedale (Hanbury). Ashbourne (Purchas).

Channel Is.—Guernsey (Miss Dawber). Jersey!

var. *tenuiscapum*.

39. Stafford: Alstonfield (Purchas and Ley). 57. Derby: Dovedale (Purchas).

Channel Is.—Jersey!

General Distribution.—Spain. France. W. Switzerland! Germany. S. Scandinavia.

. 251. *HIERACIUM PILOSELLA* L. Sp. Pl. 800 (1753); Smith, Eng. Bot. no. 1093 (1802); Tausch, Bemerk. in Flora, xi. Beil. i. 52 (1828); ex parte, Froel. in DC. Prodr. vii. 199 (1838), excl. vars.; Fries, Symb. 2 (1848) and Epicr. 10 (1862), ex parte; Backhouse, Mon. 13 (1856); Naegeli and Peter, l. c. i. 130 (1885); Hanb. Ill. Mon. 1 (1889); in Bab. Man. ed. 9, 232 (1904); Williams, l. c. 91 (1902); W. R. Lint. Brit. Hier. 9 (1905); Zahn, l. c. 1158 (1923).

Icones.—Eng. Bot. t. 1093; Curtis, Fl. Londin. iii. t. 50; Hanb. Ill. Mon. pl. 1.

Exsicc.—Dahlst. H. Sc. vi. 92, in Hb. Kew, as *H. vulgare*; H. Naeg. nos. 5 and 59, as subsp. *vulgare*; Linton no. 26 (Milford); Baker no. 1 (Thirsk); Hilton, Fishersgate, 1898; Linton, Selsley Hill, 1904; all in Hb. Mus. Brit.

Rootstock generally \pm slender, producing long prostrate, leafy, floccose, \pm pilose, sometimes branched stolons, which develop terminal rooting rosettes of overwintering leaves. Scape 1-headed, solitary or more rarely 2-4, (5-)10-20-(30) cm. high, floccose generally throughout and becoming densely so or tomentose above, with unequal, dark glandular hairs, typically dense towards the flower-head, and \pm numerous dark-based pilose hairs, usually with 1 minute bract. Leaves dull or dark green above, grey or whitish beneath, linear- to narrowly obovate-oblong, obtuse-mucronulate to subacute (rarely acute), entire or rarely obscurely glandular-denticulate, \pm long-attenuate below; those of the stolons smaller and decreasing upwards, often more attenuate towards the base; all setose above and on the margins with long, stiff, bulbous-based hairs, and densely grey- or white-tomentose beneath (less so in shade), with \pm numerous, soft, unequal pilose hairs. Heads rather small or of medium size (phyllaries 9-11 mm. long), \pm rounded below. Phyllaries incumbent in bud, greyish to blackish green, the inner especially with broad, pale margins and occasionally rosy-tipped, linear-lanceolate, acute or the innermost acuminate, floccose and \pm senescent, generally with dense, short or unequal, broad-based, black glandular and \pm numerous longer, pale or dusky, black-based pilose hairs. Ligules light yellow, the outer normally marked with red beneath. Styles yellow. Margins of receptacle-pits sharply incise-dentate. Achenes purplish black, about 2 mm. long.

β . *concinatum* Hanb. Ill. Mon. 6 (1889); in Bab. Man. ed. 9, 232 (1904); Williams l. c. 92 (1902); W. R. Lint. Brit. Hier. 9 (1905); *H. Pilosella* subsp. *angustissimum* NP. l. c. i. 156 (1885)?

Exsicc.—Hanbury, Ben Macdhuil, 1887, in Hb. Hanbury; Ley, Eardisley, 1904, in Hb. Mus. Brit.

Typically dwarf. Scape (occasionally exceeding 20 cm.) densely floccose and densely (typically finely) glandular above, normally epilose. Leaves generally less rigidly setose than in the type. Phyllaries pale grey, densely floccose and finely glandular, or darker with coarser, black glandular hairs, epilose. Outer ligules normally strongly marked with red beneath. Otherwise like the type.

γ . *concolor* Tausch, l. c. 52 (1828); Froel. in DC. Prodr. vii. 199 (1838).

Exsicc.—Pugsley, Berry Head, 1940, in Hb. Pugsley.

Dwarf (in sp. seen). Scape 5-8 cm. high, tomentose and \pm densely fine-glandular above. Leaves bright green above, grey beneath, the upper side sparingly setose. Heads rather small (phyllaries 9-10 mm. long) and narrow, scarcely rounded below. Phyllaries pale greyish green, densely floccose, with numerous fine, black glandular hairs, epilose. Ligules concolorous.

δ . *angustifolium* Tausch, l. c. 52 (1828); *H. Pilosella* subsp. *angustius* NP. l. c. i. 157 (1885); Zahn, l. c. 1175 (1923)?

Exsicc.—Groves, Penn. 1888, in Hb. Mus. Brit.; Fox, Stow Wood, 1871, in Hb. Druce.

Rootstock and stolons slender. Scape 10–15 cm. high, slender, floccose, \pm densely glandular above and with \pm numerous dark-based pilose hairs. Leaves small and narrow, linear-oblong to narrowly oblanceolate, \pm acute, rather softly setose. Heads scarcely rounded below. Phyllaries densely floccose, with much black glandular and longer, dusky pilose hair.

ε. nigrescens Fries, Symb. 2 (1848), emend. NP.; Epicr. 11 (1862); W. R. Lint. Brit. Hier. 9 (1905); *H. Pilosella* subsp. *nigrescens* NP. l. c. i. 161 (1885); *H. Pilosella* subsp. *pernigrescens* Zahn, l. c. 1168 (1923).

Exsicc.—Marshall nos. 2812, 2813 and 3050; Linton, Symonds Yat, 1904; all in Hb. Mus. Brit.

Scape normally tall (15–25 cm.) and slender, floccose (chiefly above), with many dark glandular hairs throughout (dense above) and scattered, \pm numerous, long (–4) mm.), dark pilose hairs. Leaves as in the type, but generally less tomentose beneath and acute. Heads of medium size (phyllaries 10–12 mm. long), \pm rounded below. Phyllaries blackish green, the inner with paler margins, \pm floccose, with numerous unequal, black glandular and dense, long, dusky pilose hairs.

ζ. tricholepium (NP.) comb. nov.

H. Pilosella subsp. *tricholepium* NP. l. c. i. 138 (1885); Zahn, l. c. 1165 (1923).

Exsicc.—Ley, Cheddar, 1905, in Hb. Mus. Brit. as var. *nigrescens*.

Scape tall, 15–30 cm. high, densely floccose above but sparingly so downwards, with scattered long, whitish, dark-based pilose and short, dark glandular hairs, which become \pm dense towards the flower-head. Leaves rather large. Heads rather large (phyllaries 11–12 mm. long), \pm broad and subtruncate-based. Phyllaries greyish green, densely floccose, with scattered dark glandular and dense, long, whitish black-based pilose hairs.

η. trichoscapum (NP.) comb. nov.

H. Pilosella subsp. *trichoscapum* NP. l. c. i. 13 (1885); Zahn, l. c. 1162 (1923);

H. pseudo-Pilosella Williams, l. c. 92 (1902); *H. Pilosella* var. *pseudo-Pilosella* W. R. Lint. Brit. Hier. 94 (1905); non *H. pseudo-Pilosella* Tenore, Prodr. Fl. Nap. 71 (1811).

Exsicc.—H. Naeg. no. 52; Linton, Canlochen, 1884; Linton no. 101 (Canlochen, cult. as var. *nigrescens*); all in Hb. Mus. Brit.

Stolons long-pilose. Scape \pm tall, 15–20 (–30 cult.) cm. high, floccose, chiefly towards the flower-head, rather densely pilose with very long (–6 mm.), spreading, blackish hairs, and short, dark glandular hairs throughout. Leaves narrowly elliptic-lanceolate, \pm acute, with very long setae (–6 mm.), becoming very large in cultivation (–12 cm.). Heads of medium size (phyllaries 10–11 mm. long), rounded below. Phyllaries blackish, floccose below, densely pilose with long (–3 mm.), dusky, black-based hairs, very sparingly glandular towards the tips.

The first author to deal intensively with this species was Tausch, who in his 'Bemerkungen über Hieracium' in 'Flora' (1828) subdivided it thus (xi. i. 52):—*α. vulgare*—foliis ovato-ellipticis; *β. angustifolium*—foliis lanceolato-ellipticis; *γ. denticulatum*—foliis acutis denticulatis; *δ. incanum*—foliis utrinque tomentosis; *ε. hirsutum*—foliis scapo saepe et anthodio valde hirsutis; *ζ. flagellare*—stolonibus repentibus ramosis scapigeris; *η. alpinum*—flore majori, squamis anthodii latoribus, stolonibus abbreviatis (*H. pilosellaeforme* Hoppe); *θ. concolor*—flosculis subtus concoloribus; *κ. furcatum*—scapo furcato, 2–3-floro; *λ. stoloniflorum*—scapo stolonibusque fere omnibus floriferis furcatis (*H. stoloniflorum* W. & K.). Of these varieties several are no longer regarded as falling under *H. Pilosella* L. In 1838, in the seventh volume of De Candolle's Prodrum, Froelich inserted (p. 199) eight varieties under *H. Pilosella*, three of which, *incanum*, *concolor* and *stoloniflorum*, are the same as

Tausch's. Still ten years later E. Fries (Symb. ad Hist. Hier. pp. 2 and 3) devised a fresh arrangement with four varieties only, viz. :—(1) *virescens*—foliis latioribus virentibus, floccis rarioribus, subtus vix incanis scapis saepe divisis, ligulis subtus concoloribus; (2) *nigrescens*—stolonibus scapoque elongatis, capitulis majoribus pilis glanduliferis densissimis nigricantibus, ligulis subtus concoloribus; idem gracillimum, involucri subgloboso pilis mollioribus villosissimo (*H. pseudo-Pilosella* Ten.); (3) *grandiflorum* (*H. Hoppeanum* Schultes); (4) *pilosissimum* (*H. Peleteri-anum* Mérat). The last two of these varieties are now treated as independent species.

The group was much more elaborately dealt with in Naegeli and Peter's 'Hieracium Mittel-Europas—Piloselloiden' (1885), where *H. Pilosella* is divided into 21 groups and 117 subspecies; and subsequently vast numbers of additional subspecies were published by Norrlin, Rehmann, Dahlstedt, Brenner, and others, with the result that 624 subspecies are enumerated by Zahn. This assemblage even he makes no attempt to classify or describe.

A certain number of Naegeli and Peter's and of Dahlstedt's subspecies are represented by *exsiccatae* in Herb. Mus. Brit., from which it may be seen that some are fairly distinct forms. In many other cases, however, I have failed to grasp any essential taxonomic characters. Judging from the British material examined and experience in the field, the forms of indumentum, which are largely relied on by Naegeli and Peter as a basis of classification, seem to be less constant than in *Eu-Hieracium*, and thus an important taxonomic criterion is invalidated. The presumable frequency of hybridization in the subgenus *Pilosella* may account for some of the instability of characters that might be expected to be constant.

Naegeli and Peter, followed by Zahn and others, have taken Tausch's variety *vulgare* to represent what they consider to be a dominant form of *H. Pilosella*, and have restricted the Linnaean name, in a subspecific sense, to a different and less common form. In this, as in the case of *H. aurantiacum*, they do not appear to have consulted the Linnaean type. In 'Species Plantarum' there is no original definition or description of *H. Pilosella*, and the name is founded on Hort. Cliff. 388. The specimen is missing from the Hort. Cliff., but there is another in the Linnaean Herbarium, which, according to Jackson, was there in 1753 and must be regarded as representative of the species. The sheet contains two plants, now in poor condition. Both are rather small, one with short and the other with long stolons; the leaves of both are narrow, linear-oblong and subacute; and the scapes are about 10 cm. high. The scape of one is densely floccose and dark-glandular above, in the other it is less floccose and finely glandular above, with many spreading pilose hairs. The phyllaries of the first are floccose, dark-glandular and pilose, of the second, which is damaged, pilose but doubtfully glandular. The difference between the two plants on the sheet is probably due to individual variation and may often be matched in the field; and the specimen is evidently related to the form for which the name *vulgare* Tausch has been adopted, and should be regarded as *H. Pilosella* L. sensu stricto. The above description of the species has been taken from this form.

Hanbury's variety *concinatum*, which is omitted from Zahn's enumeration, is a widely spread form in Britain that varies but little except in the fineness of the involucre glands. The *exsiccata* Linton no. 161 (*H. Pilosella* var. *concinatum*), as represented by three sheets now in Herb. Mus. Brit., consists of plants, with pilose as well as glandular phyllaries, that are referable to the typical species, as defined above, rather than to the variety.

The form here referred to var. *concolor* Tausch occurred in quantity on an exposed sea-cliff near Berry Head, South Devon. No similar specimens have been noticed among the herbarium material examined.

The variety *nigrescens*, as here interpreted, is another widely spread and fairly constant form. It seems to be closely related to *H. Pilosella* subsp. *atrovillosulum* Dahlst. according to the *exsiccata* issued by the author.

The variety *trichoscapum*, which is also allied to var. *nigrescens*, is remarkable for the abundant and extremely long pilose hairs of the foliage, scape and phyllaries.

The subspecies *latiusculum* NP. (l. c. i. 141), which has been reported as British, seems doubtfully separable from the typical species; and no specimens have been seen that can be identified with subsp. *subvirescens* NP. (l. c. i. 160). There are numerous cultivated examples in Herb. Mus. Brit. of a plant collected by Ley at Wenlock Edge, Salop, which has both scape and phyllaries pilose but nearly eglandular. No original wild specimens have been seen, but the form may be worthy of varietal distinction. A somewhat similar, dwarf plant, collected at Selham by Lacaita, has been referred to subsp. *tricholepioides* NP. (l. c. i. 139). There is little doubt but that all the British varieties are more or less connected by intermediate or sometimes possibly hybrid forms.

H. Pilosella is by far the most abundant and widely distributed hawkweed in Britain, growing in a variety of situations, poor grass-lands, road-sides, heaths and woods, wherever the soil is not too heavy. It has been recorded for every British vice-county but one; specimens have been seen from those following.

Distribution.—1. W. Cornwall: Perranporth (Barton). Sennen (Williams). 2. E. Cornwall: Fowey (Rilstone). 3. S. Devon: Torquay (Waterfall). 4. N. Devon: Countisbury! Braunton (Higgins). 6. N. Somerset: Steep Holm (Murray). Brislington (Painter). Cheddar (Ley). Uphill (Druce). 10. Wight: St. Helen's Spit (Hanbury). Ventnor (Waterfall). 11. S. Hants: Uplands (Mrs. Robinson). 12. N. Hants: Blackmoor (Vaughan). 13. W. Sussex: Fishersgate (Hilton). 14. E. Sussex: Crowborough (Morgan). Hastings (H. Wilson). Mayfield! 15. E. Kent: St. Margaret's Bay (Hanbury). Dover (Bennett). 16. W. Kent: Halstead (Mrs. Atkins). Woolwich (Tuck). Tunbridge Wells! 17. Surrey: Wimbledon! Milford (Marshall). Effingham (Salmon). 18. S. Essex: Hale End (E. Forster). 19. N. Essex: St. Osyth (Standen). 20. Herts: Allen's Green! 21. Middlesex: Hampton Court! 22. Berks: Reading (Hanbury). Upton (Druce). 23. Oxford: Wigginton (Riddelsdell). 24. Bucks: Hanslope (Druce). 26. W. Suffolk: Mildenhall (Barton). 27. W. Norfolk: Framingham (Standen). 29. Cambs: Odsey (Fordham). 30. Bedford: Luton (Dony). 31. Hunts: Warboys Fen (Fryer). 33. E. Glo'ster: Cirencester (Greenwood). 34. W. Glo'ster: Selsley (Linton). Tiddenham (Riddelsdell). 35. Monmouth: Wyndcliff (Linton). 36. Hereford: Hope Mansel (Ley). 37. Worcester: Malvern (Forbes Young). 38. Warwick: Lighthorne (Palmer). 39. Stafford: Longdon (Vincent). Newcastle (Hb. Druce). 40. Shropshire: Wenlock Edge (Ley). 41. Glamorgan: Rhossili (Riddelsdell). 42. Brecon: Llangynog (Wilmott). 43. Radnor: Elan Valley (Hanbury). 48. Merioneth: Arthog (Barton). 49. Carnarvon: Llanberis! 52. Anglesea: Beaumaris (Druce). 55. Leicester: Potter's Marston (Wade). 57. Derby: Tunsley and Great Rocks Dales (Linton). Chatsworth (Lacaita). 58. Cheshire: Heswall (Mason). 59. S. Lancs.: Chatburn (Pickard). 60. W. Lancs.: Grange (Bailey). Lancaster (Simpson). 62. N.E. Yorks: Thirsk (Baker). 63. S.W. Yorks: Elmley Woodhouse (P. F. L.). 64. M.W. Yorks: Selby (Parsons). Clapham (Ley). 66. Durham: Elwick (Middleton). Sunderland (E. Backhouse). 69. Westmorland: Bardsea (Hodgson). 70. Cumberland: Carlisle (W. B. Waterfall). 71. Man: Peel (Paton). 72. Dumfries: Eskdale (Hb. Druce). 82. E. Lothian: N. Berwick (Hb. Druce). 83. Edinburgh: Edinburgh (Forbes Young). 85. Fife: St. Andrews (Bailey). Balmuto (Syme). 87. W. Perth: Dollar (Syme). 88. Mid Perth: Comrie (W. F. Miller). 89. E. Perth: Bruar (Druce). 90. Forfar: Clova and Sands of Barry (Marshall). 91. Kincardine: St. Cyrus (Buchanan-White). 92. S. Aberdeen: Braemar (Linton). 96. E. Inverness: Aviemore (Salmon). 97. W. Inverness: Arisaig (W. F. Miller). 98. Argyll: Loch Tulla (Hanbury). 103. Mid Ebudes: Mull (Ross). 104. N. Ebudes: Uig, Skye (Linton). 105. W. Ross: Gairloch (Druce). 106. E. Ross: Tain (Druce). 108. W. Sutherland: Inchnadamph (Hanbury). 109. Caithness: Wick (Grant). Holburn Head (Marshall). 110. Outer Hebrides: Taransay (Shoolbred). Eriskay (R. B. Cooke).

Ireland.—3. W. Cork: Glengarriff (Druce). 7. S. Tipperary: Clonmell (Cummins).

8. Limerick : Foynes (Knowles). 17. N.E. Galway : Mt. Bellew (Irving). 19. Kildare : Ballitore (E. Shackleton). 20. Wicklow : Bray (Barrington). 21. Dublin : Dalkey (Malone). Portmarnock (Carroll). 23. Westmeath : Knock Drin (Levinge). 27. W. Mayo : Newport (Roffey). 33. Fermanagh : Lough Erne (Barrington). 37. Armagh : Ballyards (Hb. Druce). 39. Antrim : Belfast (Waddell).

Channel Is.—Jersey : St. Peters (Druce).

var. *concinnum*.

1. W. Cornwall : Coverack (Fox). 2. E. Cornwall : Looe (Riddelsdell). 4. N. Devon : Countisbury (Barton). 5. S. Somerset : Minehead (Marshall). 6. N. Somerset : Brean Down (Marshall). Burrington (Miss Roper). 10. Wight : Freshwater (Stratton). 11. S. Hants : Brockenhurst (Linton). 13. W. Sussex : Selham (Lacaita). 14. E. Sussex : Eastbourne (Roper). 16. W. Kent : Tunbridge Wells ! 17. Surrey : Ditton ! Oxshott ! Wimbledon Common ! 20. Herts : Hadley Wood (Parker). 21. Middlesex : Ruislip ! 22. Berks : Frilford (Druce). 23. Oxford : Wigginton and Bloxham (Riddelsdell). 26. W. Suffolk : Brandon (Hanbury). 29. Cambs : Wimpole (Stearn). 35. Monmouth : Taren yr Esgob (Ley). 36. Hereford : Berrington (Newman). Eardisley (Ley). 39. Stafford : Horton (Painter). 41. Glamorgan : Caerphilly and Aberdare (Riddelsdell). 42. Brecon : Nant-Gwylt (Ley). 46. Cardigan : Llanbadarn (Stephenson). 55. Leicester : Narborough (Wade). Leicester (Bell). 57. Derby : Ashover (Bailey). 59. S. Lancs. : Chatburn (Pickard). 64. M.W. Yorks : Bowland (Pickard). 66. Durham : Winch Bridge (Druce). 71. Man : Craig (Paton). 77. Lanark : Glasgow (Lyon). 85. Fife : St. Andrews (Bailey). 88. Mid Perth : Killin (Linton). 90. Forfar : Clova (Marshall). Canlochen (Corstorphine). 92. S. Aberdeen : Ben Macdhui (Hanbury). Braemar (Croall). 95. Elgin : — (Druce). 96. E. Inverness : Bridge of Brown (Marshall). 97. W. Inverness : Glen Roy (E. G. Baker). 103. Mid Ebudes : Staffa (R. F. Thompson). 105. W. Ross : Loch Duich and Mellon Charles (Druce). 109. Caithness : Holborn Head (Marshall).

Ireland.—2. N. Kerry : Killarney (Ridley). 5. E. Cork : Youghal (Miss Ball). 8. Limerick : Foynes (Knowles). 16. W. Galway : Dog's Bay (Barton). 21. Dublin : Royal Canal (Scully). 25. Roscommon : Wiltcevan (Mapother). 28. Sligo : Ben Bulbin (Druce).

Channel Is.—Guernsey : Grandes Rocques (Barton). Sark (Hanbury).

var. *concolor*.

3. S. Devon : Berry Head !

var. *angustifolium*.

23. Oxford : Stow Wood (Fox). 24. Bucks : Penn (Groves).

var. *nigrescens*.

4. N. Devon : Lyn Down ! 34. W. Glo'ster : Symond's Yat (Linton). 41. Glamorgan : Aberdare (Riddelsdell). 42. Brecon : Cellwen (Ley). 46. Cardigan : Borth (Stephenson). 59. S. Lancs. : Chatburn (Pickard). 64. M.W. Yorks : Ingleton (Cryer). Grassington ! 65. N.W. Yorks : Teesdale (Backhouse). 77. Lanark : Calderwood (Hb. Druce). 85. Fife : Orrock Hill (Syme). 89. E. Perth : Glen Shee (Marshall). 90. Forfar : Clova (Marshall). Glen Dole (Hanbury). 92. S. Aberdeen : Cairn Toul (Hanbury). Braemar ! 94. Banff : Tomintoul (Marshall). 96. E. Inverness : Kincaig (Somerville). 97. W. Inverness : Glen Spean (Borrer). 98. Argyll : Oban (Bailey). Inellan (R. F. Thompson). 100. Clyde Is. : Glen Sannox (Bailey). 107. E. Sutherland : Helmsdale (Linton). 108. W. Sutherland : Strath Naver (Hanbury). 111. Orkney : Mainland (Johnston).

var. *tricholepium*.

6. N. Somerset : Cheddar (Ley). 16. W. Kent : Tunbridge Wells ! 88. Mid Perth : Cluny (Wilmott). 98. Argyll : Inveroran (Hanbury). 108. W. Sutherland : Bettyhill (Linton). Glen Naver (Hanbury).

var. *trichoscapum*.

41. Glamorgan : Aberdare (Riddelsdell). 70. Cumberland : Silloth (L. H. G. Williams). 88. Mid Perth : Fortingal (Salmon). Breadalbane (Syme). 90. Forfar

Canlochen (Linton). Glen Dole (Marshall). 92. S. Aberdeen: Braemar! 96. E. Inverness: Aviemore (Salmon). 97. W. Inverness: Loch Laggan (Hanbury). 104. N. Ebudes: Sligachan, Skye (Druce). Rhum (R. B. Cooke). 105. W. Ross: Ullapool (Druce). 107. E. Sutherland: Helmsdale (Linton). 108. W. Sutherland: Bettyhill (Hanbury). 109. Caithness: Lybster (Hanbury). Thurso (Miss Todd). 111. Orkney: Maeshow (Syme).

Ireland.—8. Limerick: Foynes (Knowles). 39. Antrim: Whitehead (Praeger).

General Distribution (of the species).—Europe. Asia Minor. Siberia.

B. CAULIGERA NP. (See page 34.)

Section XV. AURICULINA.

Fries, *Epier.* 5 and 18 (1862); NP. l. c. i. 115 (1885); Rouy, l. c. 236 (1905); Zahn, l. c. 1148 (1923).

Dwarf or medium, stoloniferous plants with solitary, \pm erect, nearly leafless stems. Leaves subspathulate to lanceolate, \pm entire, glaucescent, glabrous except for scattered, long pilose hairs. Inflorescence usually compactly subcorymbose, few-headed. Heads \pm small; phyllaries obtuse (at least the inner), \pm floccose, glandular and pilose. Ligules yellow, concolorous. Styles yellow. Margins of receptacle-pits dentate. Achenes purplish black, 1.5–2 mm. long.

Flowering June–July.

This section, which is widely spread in Europe, especially in the north, is represented in Britain by two species only, one of which, *H. Lactucella*, may possibly be native.

Plant dwarf (5–20 cm.). Leaves small, \pm spathulate, obtuse, nearly glabrous. Heads small, pilose and glandular	<i>H. Lactucella</i> .
Plant taller (20–45 cm.). Leaves larger, obovate-lanceolate to lanceolate, more pilose on margins and midrib beneath. Heads larger, pilose and densely glandular	<i>H. helveolum</i> .

252. *HIERACIUM LACTUCELLA* Wallroth, Sched. Crit. i. 408 (1822); *H. Auricula* Lamk. and DC. Fl. Fr. iv. 24 (1805); Fries, *Epier.* 19 (1862); Naegeli and Peter, l. c. i. 185 (1885); Zahn, l. c. 1195 (1923); non L. Sp. Pl. 800 (1753).

Exsicc.—Lindbg. H. Sc. i. 5; H. Naeg. no. 209; Marshall, no. 2832; all in Hb. Mus. Brit. as *H. Auricula*.

Plant dwarf, with rather slender rootstock producing long, prostrate, leafy, \pm pilose stolons which may root at the nodes. Stem solitary, 5–12 (–20 cult.) cm. high, slender, suberect, sparingly pilose below, floccose and finely glandular above, generally with 1 (rarely 2) very small, mucronate or acute leaf. Leaves small, glaucescent, the the radical oblong-obovate, rounded-obtuse, entire (sometimes mucronulate), \pm attenuate below, glabrous or with scattered long pilose hairs on the margins towards the leaf-base, and sometimes beneath also along the midrib; those of the stolons smaller, more spathulate and narrowed below, not decreasing upwards. Inflorescence subcorymbose, with short accladium and (1–5) bracteate, usually simple branches; bracts with whitish margins. Heads small (phyllaries 6–8 mm. long), scarcely rounded below. Phyllaries incumbent in bud, blackish green with pale green margins, linear-lanceolate, obtuse, with numerous dark glandular and longer, dusky pilose hairs, effloccose. Ligules light yellow, concolorous. Styles yellow. Margins of receptacle-pits irregularly dentate. Achenes purplish black, 1.5–1.75 mm. long.

This plant was discovered by Marshall in 1904 in a pasture N.E. of Keevil, in Wiltshire. Although its habitat was remote from houses, he doubted its being

a native, for it occurred in a solitary patch and did not appear to flower well. The species is known throughout northern France and Belgium, and might therefore be expected to grow in the south of England, but it seems best to assume that it was accidentally introduced until it is found elsewhere.

The species was previously included in the British flora by Hudson (Fl. Anglica, 299 (1762)) on the basis of specimens found at Dalehead, near Grasmere. Smith, who did not see Hudson's plant, described and figured as *H. Auricula* L. (Eng. Bot. 2368 (1812)) a plant from Mont Cenis with hirsute foliage and inflorescence that resembles *H. glaciale* Reyn., citing as synonym Fl. Danica, t. 1044 (*H. dubium*).

Hudson also included in his Flora *H. dubium* L. from Fairfield, near Rydal, in Westmorland, and this was likewise described and figured by Smith (Eng. Bot. 2332 (1811)), who had received specimens from Cambridge, which were said to have been brought from Scotland. Fl. Danica t. 1111 (*H. Auricula*) is quoted in synonymy.

As Hudson's specimens of both species were never traced and neither of them was subsequently found in any British wild habitat, both names have been excluded from our lists.

The Linnaean Herbarium contains a specimen of *H. Auricula* which was present there in 1753 according to Jackson. There are two sheets existing there marked with the species-number 7, on one of which 'Auricula' was written by Linnaeus. Schultz-Bipontinus has labelled this sheet '*Pilosella praealtum* Sz. Sz.', and the specimen closely resembles *H. praealtum* Vill., showing no stolons. The indumentum, however, seems different and recalls *H. succicum* Fr. The unnamed sheet 7 has two different plants, labelled '*H. dubium* L.' and '*H. succicum* Fr.' respectively by Schultz-Bipontinus. Smith had previously written '*Cymosum*?' on this sheet. The specimen referred to *H. dubium* might be an abnormal example of *H. Auricula* as commonly understood, but the other resembles *H. succicum* though it does not seem identical with that of the first sheet.

In view of this mixture of specimens, and considering the dubious description in 'Species Plantarum', it is evident that the plant commonly regarded as *H. Auricula* cannot bear the Linnaean name, which is a nomen confusum. The name *H. Lactucella*, which Walloth, realizing the confusion, created to avoid it, is therefore substituted. *H. Auricula* Lamk. and DC. Fl. Fr., as adopted by Naegeli and Peter, and by Zahn, is inadmissible under the present rules of nomenclature as a later homonym.

Jackson's index has '3' marked against *H. dubium*, indicating that a specimen exists in the herbarium which was not there till after 1753, and is therefore not available as a specific type. Smith (Fl. Brit. ii. 828 (1800)) remarks 'In herbario Linnaeano desideratur'. The herbarium contains a sheet marked '6 dubium?' in Linnaeus's handwriting, to which 'may be right' was added by Smith. The specimen on this sheet is *H. Auricula* auct. with leafy stolons but the radical rosette destroyed. It is not annotated by Schultz-Bipontinus, but there is a further sheet in the herbarium, unnamed, with two small specimens of the same *H. Auricula*, which he has labelled '*H. Auricula* L.' This adds to the confusion between *H. dubium* and *H. Auricula*, and seems to warrant the abandonment of both names. The *H. dubium* of Eng. Bot. no. 2332 appears from the plate to differ from all of the Linnaean specimens and to be intermediate between *H. Auricula* auct. and *H. succicum* Fr.

Distribution.—8. S. Wilts : Keevil (Marshall).

General distribution.—Throughout Europe, except S. Spain, Sardinia, Sicily and Greece; extending into W. Siberia.

253. *HIERACIUM HELVEOLUM* (Dahlstedt) Pugsley in Journ. Ecol. xxxiii. 347 (1946).

H. floribundum Wim. and Gr. subsp. *helveolum* Dahlst. H. Exs. iv. 14 and 15 (1891); and in Act. Hort. Berg. ii. 4, 13 (1894); *H. cochleatum* NP. subsp. *helveolum*

Zahn, l. c. 1296 (1923) : *H. suecicum* Fr. subsp. *helveolum* Omang, Hier. Norwegens, i. 40 (1935).

Exsicc.—Dahlst. H. Exs. iv. 14 and 15 ; Stewart, Whitewell, Belfast, 1897, as *H. Auricula* ; all in Hb. Mus. Brit.

Rootstock rather thick, producing leafy stolons (none seen in British specimens in herb.). Stem 20–35(–45) cm. high, erect, rather slender, hollow, densely whitish-pilose about the base, and with ± numerous long, spreading, dark-based pilose and shorter, dark glandular hairs throughout, usually with 1 (rarely 2) sessile stem-leaf, resembling the inner basal but smaller. Leaves of medium size (–9 cm. long), ± glaucescent, obovate-lanceolate to lanceolate, obtuse to acute, subentire or obscurely denticulate, ± long-attenuate below, with scattered long pilose hairs on the margins (chiefly towards the base) and on the midrib beneath. Inflorescence ± compactly paniculate-corymbose, 5–8-headed, with rather short acladium and branches, which are densely floccose and dark-glandular ; bracteoles with whitish margins. Heads rather small (phyllaries 8–9 mm. long), rounded below. Phyllaries incumbent in bud, blackish green, the inner with paler margins, linear-lanceolate, obtuse, slightly floccose below, with dense unequal, black glandular and ± numerous longer, dusky pilose hairs. Ligules yellow, concolorous. Styles yellow. Margins of receptacle-pits shortly dentate. Achenes purplish black, about 2 mm. long.

This plant was first found in Britain in 1897 by S. A. Stewart on the débris of the Whitewell limestone quarries at Cave Hill, Belfast, and was seen there for several successive years. It was named *H. Auricula* L. by Linton, and was distributed through the Botanical Exchange Club (B. I.) under that name. Its origin at Belfast is unknown.

It is a much larger plant than *H. Lactucella* Wallr., with longer leaves and larger heads, and bears considerable resemblance to *H. dubium* as depicted by Smith in Eng. Bot. t. 2332. The Irish specimens seen show no stolons but these may presumably be produced. The plant is clearly one of the *suecicum* group, and seems to match Dahlstedt's *exsiccata* cited above, which is well represented in Herb. Mus. Brit. Dahlstedt's specimens, however, are stoloniferous.

Distribution (naturalized).

Ireland.—39. Antrim : Belfast (Stewart).

General Distribution.—Norway. Sweden.

Section XVI. PRATENSINA.

Ascherson, Fl. N.-O.-Deutsch. Flachl. 776 (1898) ; Zahn, l. c. 1148 (1923) ; *Auriculina* Fries. Epier. 5 and 18 (1862), ex parte ; *Collinina* NP. l. c. i. 116 (1885).

Stoloniferous plants of relatively tall growth, with erect, hollow, long-pilose and slightly leafy stems. Leaves lanceolate or obovate-lanceolate to elliptic, green, not rigid, pilose on both surfaces with ± long, stiff hairs. Inflorescence paniculate-corymbose, ± compact and many-headed (except in *H. flagellare*). Heads ± small (larger in *H. flagellare*) ; phyllaries obtuse to acute, long-pilose. Ligules yellow to deep red. Styles yellow to livid. Margins of receptacle-pits ± dentate. Achenes purplish black, 1.75–2.5 mm. long.

Flowering June–July.

The species of this Section are mainly north and central European, although extending into western Asia. Four have been found in Britain, whereof one, *H. colliniforme*, may be a native plant. Of the others, *H. aurantiacum*, which has been cultivated in Europe for about three and a half centuries, is known to have been naturalized in Scotland for one hundred and fifty years, and still occurs in some of its old stations. *H. brunneocroceum* has also been naturalized here for nearly a

century and is now a widely spread species in England and Wales. *H. flagellare* is known only as a very locally naturalized plant on railway banks. The Section is notable for the red flowers of some of its species.

Series *Stoloniflora* [Grex *H. stoloniflorum* Wald. and Kit.].

Inflorescence lax, with few heads of medium size. Ligules yellow, concolorous.

Leaves pale green, obovate-lanceolate. Inflorescence subracemose with
± long acladium *H. flagellare*.

Series *Eu-Pratensisina* [Grex *H. pratense* Tausch].

Inflorescence ± dense, with many ± small heads. Ligules yellow to deep red.

Leaves yellowish green, narrowly obovate-lanceolate to lanceolate.
Heads small. Ligules yellow, concolorous *H. colliniforme*.
Leaves deep green, obovate-oblong to elliptic. Heads rather small.
Ligules bright red. *H. aurantiacum*.
Leaves yellowish green, oblong to oblanceolate. Heads small. Ligules
brownish orange *H. brunneocroceum*.

Series *Stoloniflora*. (See page 322.)

254. *HIERACIUM FLAGELLARE* Willdenow, Enum. Hort. Berol. Suppl. 54 (1813); *H. flagellare* subsp. *flagellare* NP. l. c. i. 379 (1885); Zahn, l. c. 1279 (1923); *H. Pilosella* var. *stoloniflorum* Tausch, Bemerk. in Flora, xi. Beil. i. 52 (1828), ex parte; *H. stoloniflorum* Koch, Syn. ed. 2, ii. 810 (1844); Fries, Epicr. 12 (1862); non Wald. and Kit.; *H. Pilosella* var. *viride* Hanb. Ill. Mon. 4 (1889).

Exsicc.—*H.* Naeg. no. 29: Syme, Edinburgh, 1871; Druce, Hanslope, 1901; all in Hb. Mus. Brit.

Rootstock oblique, producing freely elongate, pilose, leafy and sometimes branched stolons. Stem solitary, or with several lateral from the leaf-axils, (10–)15–30(–40) cm. high, ascending, rather slender, ± densely pilose throughout with long, spreading, dark-based hairs, with numerous fine, dark glandular hairs intermixed, becoming ± floccose upwards. Leaves not large (rarely –12 cm. long), pale or yellowish green; the basal ± narrowly obovate-lanceolate, sometimes long-attenuate below, obtuse-mucronate to acute, subentire or obscurely glandular-denticulate; the cauline (placed low on the stem) 1–3, resembling the inner basal but smaller, acute and diminishing upwards; those of the stolons smaller and long-attenuate below; all clothed with long, stiff, bulbous-based pilose hairs above, and softer pilose hairs, especially on the midrib, beneath, the lower surface also ± floccose, margins ciliate. Inflorescence lax, asymmetrically racemose-paniculate, 2–5-headed, with short to very long (–70 mm.) acladium, and long, 1–2-headed, suberect branches from the leaf-axils; branches and peduncles floccose and densely fine-glandular, with ± numerous spreading, dark-based pilose hairs. Heads of medium size (phyllaries 10–12 mm. long), normally broad and truncate-based. Phyllaries incumbent in bud, dark olive-green, the inner with paler margins, narrow, linear-lanceolate, acute, floccose (chiefly towards the base), with dense glandular and ± numerous longer pilose hairs. Ligules yellow, concolorous. Styles yellow or fuscous. Margins of receptacle-pits incise-dentate. Achenes purplish black, 1.75–2 mm. long.

This plant was first discovered, naturalized, in 1869 by J. H. Balfour and J. Sadler on the Granton railway banks near Edinburgh, where it was growing in great profusion and may have escaped from the Edinburgh Botanical Garden. The discovery was reported in the 'Journal of Botany' of the same year (p. 337). Thirty years later it was found by G. C. Druce on a railway embankment near Hanslope, in Bucks, where it was increasing in 1923 and probably still persists.

Distribution (naturalized).—24. Bucks: Hanslope (Druce). 83. Edinburgh: Granton (Balfour and Sadler).

General Distribution.—Russia. Poland. Germany. Bohemia. Hungary. Naturalized in France.

Series **Eu-Pratensina**. (See page 322.)

255. **HIERACIUM COLLINIFORME** (Naegeli and Peter) Roffey in Lond. Cat. ed. 11 (1925); *H. collinum* Gochnat subsp. *colliniforme* NP. l. c. i. 308 (1885); *H. pratense* subsp. *colliniforme* Zahn, l. c. 1270 (1923); *H. pratense* Tausch, Bemerk. in Flora, xi. Beil. i. 56 (1828), ex parte; Fries, Epicr. 23 (1862); Balfour in Journ. Bot. vi. 353 (1868); Hanb. Ill. Mon. 9 (1889); in Bab. Man. ed. 9, 232 (1904); W. R. Lint. Brit. Hier. 10 (1905).

Icones.—Journ. Bot. t. 86; Hanb. Ill. Mon. pl. 4.

Esicc.—H. Naeg. nos. 85 and 151; Linton no. 27; Brotherston, Selkirk, 1873; Craig-Christie, Edinburgh, 1876; all in Hb. Mus. Brit.

Rootstock oblique, producing \pm *elongate, pilose, leafy stolons*. Stem (20–)30–40(–50) cm. high, erect, robust, hollow (laterals occasionally developed from the rosette, shorter and slenderer, with 3–6 cauline leaves), \pm *densely pilose*, especially near the base, *with long, spreading, pale hairs*, which are dark-based in the upper half of the stem where they are interspersed with scattered short glandular and floccose hairs. *Leaves* rather large (–15 cm. long, cult.), *yellowish green*; the radical *narrowly obovate-lanceolate to lanceolate*, rounded-obtuse to acute, subentire to obscurely sinuate-denticulate, generally long-attenuate below; the cauline 1–4, resembling the radical but decreasing in size upwards, and becoming acuter and less attenuate below; those of the stolons small and usually obtuse; all *with scattered pilose hairs* on both surfaces (denser on the midrib beneath) and ciliate margins. *Inflorescence paniculate-subumbellate-corymbose* (often compact and crowded), with subumbellate branches exceeding the short accladium, (6–)15–30-headed, the branches and peduncles floccose, with numerous short, dark glandular and some solitary, long pilose hairs. *Heads small* (phyllaries 6–9 mm. long), rounded below. *Phyllaries* incumbent in bud, *dark olive or blackish green*, the inner with paler margins, linear-lanceolate, *obtus*, \pm *floccose below, with many long, pale or dusky, dark-based pilose and shorter, dark glandular hairs*. *Ligules yellow, concolorous*. *Styles fuscous*. Margins of receptacle-pits shortly dentate. Achenes purplish black, about 1.75 mm. long.

This Central European plant was discovered in 1868 by the river Ettrick, between Selkirk and Philiphaugh, by J. H. Balfour, who described and figured it in the 'Journal of Botany' (l. c.) as an addition to the British flora. It has subsequently been found in a few other Scottish and English counties, in some of which it may be indigenous. The only species with which it might be confused in Britain is *H. helveolum*, which differs in its glaucescent, sparingly pilose foliage and its fewer, larger heads.

Distribution.—37. Worcester: Bromsgrove (Miss Wilkinson). 40. Shropshire: Shrewsbury (Melvill). 79. Selkirk: Philiphaugh (Balfour). 82. Haddington: Longniddry (Craig-Christie). 83. Edinburgh: Edinburgh (Craig-Christie). 90. Forfar: Dundee (Corstorphine). 95. Elgin: Forres (Syme). 96. E. Inverness: Aviemore!

General Distribution.—Germany. Sweden. Naturalized in North America.

256. *HIERACIUM AURANTIACUM* L. Sp. Pl. 801 (1753); Smith, Eng. Bot. no. 1469 (1805); Backh. Mon. 15 (1856); Fries, Epicr. 24 (1862) ex parte; Syme, E. B. ed. 3, 166 (1866); Hanb. Ill. Mon. 7 (1889); in Bab. Man. ed. 9, 232 (1904); Pugsley in Journ. Bot. lix. 60 (1921); *H. aurantiacum* subsp. *spanochaetium* (et subsp. *cleropurpureum*?) NP. l. c. i. 291 and 293 (1885); Zahn, l. c. 1241 (1923).

Icones.—Eng. Bot. t. 1469; Hanb. Ill. Mon. pl. 3; Pl. 15, fig. b.

Exsicc.—H. Naeg. nos. 81 and 150; Brotherston, Hirsell Wood, 1872; D. Cooper, St. Lawrence, 1838; Baker no. 2 (Cleveland); Trimen, Stanmore, 1866; all in Hb. Mus. Brit.

Rootstock oblique, producing \pm elongate, pilose, prostrate and leafy (or underground with rudimentary leaves) stolons. Stem 30–40(–70) cm. high (laterals occasionally developed in cultivation from the axils of the rosette-leaves), erect, robust, hollow, \pm densely pilose with long, spreading, unequal, black-based hairs, becoming also dark-glandular and floccose towards the inflorescence. Leaves rather thin, deep green or glaucescent, often large in cultivation (rarely –30 cm. long); the radical elliptic to oblong-obovate, obtuse-mucronulate or the inner acute, subentire or obscurely and remotely denticulate, rather shortly contracted below or \pm long-attenuate in cultivation; those of the stolons smaller and narrower; the cauline 1–2(–4), smaller than the radical and decreasing upwards, \pm oblong, subacuminate, subentire, shortly narrowed below; all densely pilose on both surfaces (especially above) and on margins with stiff, bulbous-based (1.5–4 mm.) hairs. Inflorescence paniculate-corymbose (2–)5–15(–25)-headed, the peduncles short, densely floccose and dark-glandular, and \pm pilose with long, dusky hairs. Heads rather small (phyllaries 8–10 mm. long), rounded below. Phyllaries incumbent in bud, blackish green, with \pm broad, whitish green margins, the inner tipped with red, linear-lanceolate, obtuse, clothed with dense, long (2–3 mm.), dusky pilose and numerous dark glandular hairs, slightly floccose towards the base. Ligules bright brownish red (purplish when dry). Styles light livid. Margins of receptacle-pits obscurely dentate. Achenes purplish black, 2–2.5 mm. long.

Owing to the unique and striking colour of its flowers *H. aurantiacum*, which is naturally a subalpine plant, was widely cultivated, both here and on the continent, as early as the beginning of the seventeenth century, and was well known to many pre-Linnaean authors, as explained at length in my paper in the 'Journal of Botany' cited above. Parkinson (Paradisus, p. 300 (1629)) gives a fair and unmistakeable figure of it, and Johnson (Herball, 1633) also portrays it well, as '*H. hortense latifolium* sive *Pilosella major*, Golden Mouse-eare or Grimme the Colliar'. He remarks 'This is a stranger and only to be found in some few gardens'. It is well represented in the Hortus Cliffortianus, the Linnaean herbarium, and some of the collections of the Sloane herbarium.

The plant seems to have been first found wild in Britain by Robert Brown, in 1793, by a wood between Killin and Kenmore, in Perthshire. His specimen is in Herb. Mus. Brit. It was subsequently published as a new British species by Smith in 'English Botany' on the basis of specimens found by George Don in woods in Banffshire. The figure is taken from a dwarf example probably obtained in a natural habitat. The plant is still much more frequently seen in Scotland and the north of England than in the south, both naturalized and under cultivation.

Naegeli and Peter (l. c.), in dealing with *H. aurantiacum*, apparently did not see the Linnaean type, and selected as the typical plant of Linnaeus a widely different and commoner form, distinguished in 1921 (l. c.) as *H. brunneocroceum* Pugsley; in this they have been followed by Zahn. A curious point in connection with *H. aurantiacum* is the common description of its flowers by continental authors as purple. In life they are of a vivid brick-red colour (brownish red according to Syme) without the slightest tinge of purple, indeed rather approaching orange-red. When dried, however, they generally change to a purplish wine-colour, and this suggests that the descriptions have been taken from exsiccatae without any knowledge of the living plant.

Distribution (naturalized).—10. Wight : St. Lawrence (D. Cooper). 21. Middlesex : Stanmore (Trimen). 54. N. Lincs : Friskney (Riddelsdell). 59. S. Lincs. : Aigburth (Mason). 62. N.E. Yorks : Cleveland (Baker). 64. M.W. Yorks : Settle (R. F. Thompson). 68. Cheviotland : Hulne Park (Richardson). Berwick-on-Tweed (Hume). 77. Lanark : Bothwell (Horne). 79. Selkirk : Galashiels ! 80. Roxburgh : Ormiston (Hutmacher). 81. Berwick : Hirsell Wood (Brotherston). 85. Fife : Valleyfield (Bayley Balfour). 87. W. Perth : Kinross (Walker Arnott). 88. Mid Perth : Kenmore (R. Brown). 90. Forfar : Pearsie and Den of Mains (Gardiner). 94. Banff : Craigston (G. Don).

Channel Is.—Guernsey (Piquet).

General Distribution.—E. Switzerland. Tirol ! Styria.

257. *HIERACIUM BRUNNEOCROCEUM* Pugsley in Journ. Bot. lix. 67 (1921) ; *H. aurantiacum* subsp. *aurantiacum* NP. l. c. i. 288 (1885) ; Zahn, l. c. 1242 (1923) ; non *H. aurantiacum* L.

Icon.—Fl. Danica, t. 1112 (as *H. aurantiacum*).

Exsicc.—Lindbg. H. Sc. i. 11 ; H. Naeg. nos. 17, 80 and 122 ; Marshall no. 4190 ; Reid, Newlyn East, 1903 ; Riddelsdell, Adderbury, 1920 ; all in Hb. Mus. Brit. as *H. aurantiacum*.

Rootstock emitting, often *abundantly* and continuously, *elongate*, \pm *pilose*, *prostrate*, *leafy* and also underground, scaly *stolons*. *Stem* (10–)20–50(–70) cm. high (laterals rarely developed from the leaf-axils of the rosettes), erect, robust, hollow, *densely pilose with unequal, long, spreading, pale hairs*, which become dark-based and *dusky towards the inflorescence*, also finely dark-glandular and \pm *floccose*. *Leaves* rather thin, *bright or yellowish green* ; the radical *oblong to linear-oblong or oblanceolate*, rounded-obtuse-mucronulate or the inner subacute, subentire to obscurely denticulate, generally long-attenuate below ; those of the stolons smaller and narrower ; the cauline 1–2(–4), decreasing upwards, resembling the inner basal but acute with less attenuate base ; all \pm *densely long-pilose* (2–5 mm.) on surfaces and margins, especially above and on the midrib beneath. *Inflorescence compactly paniculate-corymbose*, 5–25-headed, with short acaudium, branches and peduncles, which are floccose and densely dark-glandular with many long, dusky pilose hairs. *Heads small* (phyllaries 7–8 mm. long), rounded below. *Phyllaries* incumbent in bud, *blackish green*, the inner only with \pm *paler margins* and tipped with red, rather narrow, linear-lanceolate, *obtuse, with dense long* (–4 mm.), *dusky pilose and shorter, dark glandular hairs*, obscurely floccose. *Ligules brownish orange*, the innermost rather lighter, all purplish or dark red when dry. *Styles light livid*. Margins of receptacle-pits finely and irregularly dentate. Achenes purplish black, about 2 mm. long.

This plant, which has a wide distribution in the mountainous districts of Central Europe, appears to have been brought into cultivation and to have become naturalized in Britain at a comparatively recent date. The earliest exsiccatae seen in herbaria are 'F. J. A. Hort, Harwick, Chepstow, 1853' and 'W. A. Hayne, Culbone, Somerset, 1867'.

Unlike *H. aurantiacum*, it is common in gardens of southern Britain and, as a naturalized plant, has been collected chiefly in the Midlands and south of England, and in Wales. I have only two records for Scotland, both of recent date.

H. brunneocroceum is of a much more rampant and aggressive habit of growth than *H. aurantiacum* and often spreads by its numerous stolons far too rapidly for the gardener.

Distribution (naturalized).—1. W. Cornwall : Newlyn East (Reid). St. Mawgan-in-Pydar (Davey). 2. E. Cornwall : Boscastle ! 4. N. Devon : Barnstaple (Marshall). Trentishoe (Carruthers). Lynton (Linton). 5. S. Somerset : Culbone (Hayne). 11. S. Hants : Romsey (Groves). 12. N. Hants : Fleet (Watts). 14. E. Sussex :

Groombridge! 23. Oxford: Adderbury (Riddelsdell). Great Tew (French). Witney (Druce). 33. E. Glo'ster: Cirencester (Greenwood). 34. W. Glo'ster: Drybrook (Riddelsdell). 35. Monmouth: Tintern (Linton). Chepstow (Hort). 36. Hereford: Aymestrey (Fryer). 37. Worcester: Selly Oak (H. S. Thompson). 39. Stafford: Lichfield (Druce). 40. Shropshire: Aston-on-Clun (Higgins). 41. Glamorgan: Pontneath-Vaughan (Riddelsdell). 44. Carmarthen: Glynhir (Ley). 49. Carnarvon: Great Orme (Cripps). Crickieth! 55. Leicester: Swithland (Foord-Kelcey). Broomsgrove (Mrs. Wedgwood). 57. Derby: Matlock (Roffey). 59. S. Lanes.: Formby (Wheldon). 62. N.E. Yorks: Grosmont (Flintoff). 64. M.W. Yorks: Baildon (Cryer). 66. Durham: Darlington (Backhouse). 69. Lake Lanes: Coniston (Roffey). 71. Man: Peel (Paton). 90. Forfar: Dunnichen (Corstorphine). 105. W. Ross: Kyle of Loch Alsh (Druce).

Ireland.—2. N. Kerry: Killarney (Scully). 3. W. Cork: Glengariff (Barrington). 17. N.E. Galway: Mt. Bellew (Bayly). 39. Antrim: Belfast (Stewart).

General Distribution.—France (Auvergne). Switzerland! Austria. Germany. Hungary. Bosnia. Naturalized in South Scandinavia and North America.

Section XVII. **PRAEALTINA.**

Naegeli and Peter, l. c. i. 117 (1885); Zahn, l. c. 1149 (1923); *Cymella* * *H. praealta* Fries, *Epier.* 6 and 29 (1862).

Plants, stoloniferous or not, of relatively tall growth, with erect, firm, usually slightly leafy stems. Leaves lanceolate to linear, \pm glaucescent, rigid, glabrate to \pm setose. Inflorescence usually paniculate-corymbose, compact to lax, many- or very many-headed. Heads small to very small; phyllaries subacute to obtuse. Ligules yellow, concolorous. Styles yellow. Margins of receptacle-pits incisedentate. Achenes purplish black, 1.5–2 mm. long.

Flowering May–July, and sometimes later.

Three species of this widely distributed European group have been found naturalized in Great Britain in recent years, chiefly on railway banks in the south of England.

Series *Eu-Praealtina* [Grex *H. praealtum* Vill.].

Plant not stoloniferous.

Stem tall (–80 cm.). Leaves sparingly setose and ciliate. Inflorescence –45-headed. Heads very small. Phyllarie with \pm numerous glandular and fewer, longer pilose hairs *H. praealtum*.

Series *Bauhinia* [Grex *H. Bauhinii* Besser].

Plant stoloniferous.

Stem –50 cm. Leaves long-setose. Inflorescence –25-headed. Heads small. Phyllaries densely long-pilose, \pm glandular *H. arvorum*.
Stem –70 cm. Leaves glabrous or sparingly setose. Inflorescence compact, subumbellate-corymbose. Heads very small. Phyllaries slightly glandular, \pm pilose *H. Spraguei*.

Series **Eu-Praealtina.** (See page 326.)

258. **HIERACIUM PRAEALTUM** Villars ex Gochnat, Tent. Pl. Cich. 17 (1808); Voyage, 62 (1812); *H. florentinum* All. subsp. *praealtum* NP. l. c. i. 539 (1885); Zahn, l. c. 1402 (1923).

Exsicc.—*H.* Naeg. no. 263; Druce, Hanslope, 1906; both in Hb. Mus. Brit.

Rootstock oblique, producing *rosettes of leaves without stolons*. Stem solitary or with 1-4 lateral, *tall* 40-60(-80) cm. *high*, erect, rigid, often purplish below, with scattered dark-based pilose and shorter, dark glandular hairs, or nearly glabrous. *Leaves firm, ± glaucescent*; the radical (except the narrowly obovate-oblong outermost) *linear-oblong to linear-lanceolate*, obtuse to acute, subentire, often but little attenuate below; *cauline* 2-3(-5), placed low on the stem and decreasing upwards, linear-oblong to linear-lanceolate, acute, subentire, scarcely attenuate to the stem; all *glabrous except for a few scattered, bulbous-based hairs* on the margins, upper leaf-surface and the midrib beneath. *Inflorescence paniculate-corymbose*, 10-30(-45)-headed, the branches exceeding the short or long acladium, with frequently a long lower one from the uppermost leaf-axil; branches and peduncles floccose, with ± numerous, dark glandular and some solitary longer, dusky pilose hairs. *Heads very small* (phyllaries 6-7 mm. long), rounded below. *Phyllaries incumbent* in bud, *olive or blackish green*, the inner with paler margins, linear-lanceolate, *subacute*, ± floccose, with ± numerous dark glandular and fewer, longer pilose hairs. *Ligules yellow, concolorous*. Styles yellow. *Margins of receptacle-pits bluntly incise-dentate*. Achenes purplish black, 1.75-2 mm. long.

This plant was discovered by G. C. Druce in 1899 on a railway cutting near Hanslope, Bucks, in the neighbourhood of *H. flagellare*, which was found there at about the same time. It was still growing there in 1923. It does not appear to have been seen elsewhere in Britain, and it is not known how it was introduced.

Distribution (naturalized).—24. Bucks: Hanslope (Druce).

General Distribution.—Central Europe from Belgium, Eastern France and North Italy to Poland and Russia.

Series **Bauhinia**. (See page 326.)

259. *HIERACTIUM ARBORUM* (Naegeli and Peter) Pugsley in Journ. Ecol. xxxiii. 347 (1946).

H. magyaticum NP. subsp. *arborum* NP. l. c. i. 586 (1885); *H. Bauhinii* Besser subsp. *arborum* Zahn, l. c. 1428 (1923).

Exsicc.—H. Naeg. no. 205; Hurst, Hungerford, 1918; both in Hb. Mus. Brit.

Rootstock oblique, producing freely *long, prostrate, pilose, leafy stolons*. Stem solitary, 30-50 cm. *high*, erect, rigid, sometimes purplish below, *pilose throughout* with long, spreading, dark-based hairs, and with scattered solitary, shorter glandular hairs, becoming ± floccose towards the inflorescence. *Leaves firm, pale or glaucescent green*; outer radical obovate-lanceolate, inner *lanceolate to linear-lanceolate*, obtuse to acute, subentire, ± long-attenuate below; *cauline* 2-3, placed low on the stem, linear-lanceolate, acute, scarcely attenuate below, much diminishing upwards; those of the stolons small, lanceolate, acute; all with ± numerous long, sometimes bulbous-based hairs on the upper surface and the midrib beneath, with sparingly long-ciliate margins, or wholly subglabrous; effloccose in British forms. *Inflorescence* compactly to laxly *paniculate-corymbose*, (10)-15-25-headed, with short or long acladium often exceeded by the upper branches, with sometimes a long lower branch; branches and peduncles floccose with dense, unequal glandular and ± numerous, long pilose hairs. *Heads small* (phyllaries 6-8 mm. long), rounded below. *Phyllaries incumbent* in bud, *blackish green*, the inner with pale margins, linear-lanceolate, *subacute*, ± floccose, *densely long-pilose* with pale, dark-based hairs especially towards the tips, with many shorter, dark glandular hairs. *Ligules yellow, concolorous*. Styles yellow. *Margins of receptacle-pits bluntly incise-dentate*. Achenes purplish black, 1.75-2 mm. long.

This plant was discovered in 1918 by Mr. C. P. Hurst naturalized on a railway bank at Hungerford, Berks, and subsequently, also by the railway, at Great Bedwyn, in Wilts. The Wiltshire form differs somewhat in its more glabrous foliage and densely long-pilose peduncles.

Distribution (naturalized).—7. N. Wilts : Great Bedwyn (Hurst and Druce).
22. Berks : Hungerford (Hurst).

General Distribution.—Russia. Germany. Austria.

260. *HIERACIUM SPRAGUEI* sp. nov.

H. Bauhinii Besser subsp. *Spraguei* Zahn MS.

Ersicc.—Sprague, between Chorley Wood and Chalfont Road, Bucks, 1923 ; idem, 1925 (type in Hb. Kew) ; both in Hb. Kew and Hb. Mus. Brit.

Rhizoma obliquum, stolones elongatos pilosos foliatis emittens. *Caulis* solitarius (vel 1-5 laterales adscendentes magis foliati), 35-70 cm., erectus, *rigidus*, basin versus purpurascens, pilis ± sparsis basi nigricantibus patentibus et in dimidio superiore glandulis solitariis obscuris brevioribus obsitus. *Folia rigida, suberecta, glaucescentia* ; basalia *oblonga ad lanceolata vel lineari-lanceolata*, obtuso-mucronulata ad acuta, subintegra, inferne ± attenuata ; caulina 1-5 in caulis dimidio inferiore (in caulibus lateralibus numerosiora), parva et sursum minima, lanceolata, acuta ad acuminata, ad basin sessilem vix angustata ; stolonum parva, lanceolata, acuta ; omnia *glabra aut* superne et in paginae inferioris costâ dorsali *sparsim longe setosa*, interdum parce ciliata. *Anthela compacte paniculato-subumbellata*, 10-50-*cephala*, ramis superioribus brevibus apice subumbellatis ± confertis acladium breve superantibus, nonnunquam 1-2 inferioribus longioribus ; rami pedunculique floccosi glandulis multis obscuris obsiti hinc inde parce pilosi. *Involucra minima* (squamae 5-6 mm. longae), latiuscula, basi subtruncata. *Squamae obscure olivaceae* (inferiores marginibus pallidis latis), lineari-oblongae, *obtusae*, leviter flocculosae, *glandulis sparsis obscuris pilisque longioribus obscuris paucis ad multis vestitae*. *Ligulae luteae concolores*. Styli lutei. Alveoli receptaculi margine argute inciso-dentati. Achaenia atropurpurea, circa 1.5 mm. longa.

Rootstock oblique, emitting *elongate, pilose, leafy stolons*. *Stem* solitary (or with 1-5 ascending, more leafy laterals), 35-70 cm. *high*, rigid, purplish about the base, with ± scattered, dark-based, spreading pilose hairs, and some solitary shorter dark glandular ones in the upper half. *Leaves rigid, suberect, glaucescent* ; the radical *oblong to lanceolate or linear-lanceolate*, obtuse-mucronulate to acute, subentire, ± attenuate below ; the cauline 1-5 (more on lateral stems) in the lower half of the stem, small and diminishing upwards, lanceolate, acute to acuminate, scarcely narrowed to the sessile base ; those of the stolons small, lanceolate, acute ; all *glabrous or with long setose hairs* on the upper side and the midrib beneath, sometimes sparingly ciliate. *Inflorescence compactly paniculate-subumbellate*, 10-50-*headed*, with short, subumbellate, ± crowded upper branches exceeding the short acladium, and sometimes 1-2 longer lower ones ; branches and peduncles floccose with many dark glandular and occasionally a few longer pilose hairs. *Heads very small* (phyllaries 5-6 mm. long), rather broad, subtruncate-based. *Phyllaries incumbent* in bud, *dark olive green*, the inner with broad, pale margins, linear-oblong, *obtusae*, slightly flocculose, *with scattered dark glandular and few or many long, dusky pilose hairs*. *Ligules yellow, concolorous*. Styles yellow. Margins of receptacle-pits sharply incise-dentate. Achenes purplish black, about 1.5 mm long.

This plant is described from specimens collected by Dr. T. A. Sprague in a road cutting between Chorley Wood and Chalfont Road railway station, Bucks, on 17th June 1923, and again on 5th July 1925. The station is on the borders of Bucks and Herts. Specimens of the later gathering were referred to Zahn, who described the plant as a new subspecies *Spraguei* of *H. Bauhinii* Besser ; but the description was never published. The plant closely resembles *H. magyaticum* subsp. *Weissianum* NP. (*H. Bauhinii* subsp. *Weissianum* Zahn), but differs by its sparingly floccose and more strongly glandular heads. Its origin in Bucks is unknown, but the habitat

is close to a railway and it may have been introduced through the war of 1914-18. It is possible that it will eventually be identified with some described continental form. In existing circumstances, however, it seems best to follow Zahn in treating it as a distinct entity.

The distribution of *Hieracia* in Britain and their origin.

The first thing to arrest attention in considering the distribution of the British hawkweeds is the contrast afforded by the two Subgenera *Eu-Hieracium* and *Pilosella*. A British botanist visiting the Alps or Scandinavia cannot fail to notice numerous distinct forms of both groups. In Schinz and Keller's 'Flora der Schweiz', ed. 2, pt. ii, about 80 pages are devoted to *Eu-Hieracium* and 40 to *Pilosella*, and thus in Switzerland about one-third of the subspecies of the whole genus fall within the latter subgenus. No less than 286 subspecies or hybrids of Swiss *Pilosella* are described. In Britain, on the contrary, while the subgenus *Eu-Hieracium* similarly comprises a large number of species or subspecies, a single species, *H. Pilosella* L., itself almost constitutes the whole subgenus *Pilosella*. And strangely enough, *H. Pilosella* is a far more abundant and ubiquitous plant in the British Isles than any species of *Eu-Hieracium*. So far as distribution in Britain is concerned, therefore, interest centres in the latter subgenus.

Two hundred and forty-nine species of *Eu-Hieracium* are described in this Prodromus, 170 phyllopodous and 79 aphyllopodous plants, the latter number including the intermediate forms grouped as *Transitoria*. Their distribution in Britain is shown in the subjoined table. The vice-counties appearing under each species in this table, which are all taken from actual specimens examined, are necessarily not complete, though they will probably not be materially exceeded in many cases. Further, it is at least possible that the affinities of some species have not been sufficiently weighed and that they are not placed in their most natural groups. The enumeration certainly does not include all the distinct forms that grow in Britain, especially among the *Phyllopoda*. Numerous forms, probably for the most part endemic, have yet to be described. I have myself collected *in situ* 137 of the described species, 102 and 35 of the *Phyllopoda* and *Aphyllopoda* respectively.

Of the 249 described species no less than 180 (122 phyllopodous and 58 aphyllopodous) are believed to be endemic. This conclusion is based on Zahn's distributional data, with the species here described for the first time and not known to him assumed to be endemic. The question of endemism in a protean genus like *Hieracium* is a difficult one. A form may have been evolved in these islands morphologically indistinguishable from another that has arisen independently in France or Scandinavia; and this, though a real endemic, cannot be recognized and treated as such. On the other hand, plants growing in Britain that cannot be matched with any Continental specimens, and so appear to be endemics, may not actually be so, for the same form, even of the same origin, may exist abroad and be unknown to botanists, or may be so poorly represented in herbaria, or so inaccessible there, that its identity may have been overlooked. The only practical course, therefore, is apparently to treat as endemic all plants that cannot be identified with others described abroad. On this basis, the proportion of endemic hawkweeds in Britain is seen to be a very large one.

An attempt will now be made to explain the distribution of our hawkweeds and the presence of so many endemics, though it is realized that in doing this it is easy to cross unawares from the domain of fact to the region of speculation and perchance to the realms of fancy and of nonsense. The polymorphic character of *Eu-Hieracium* has been shown in the Introduction to be due only in a small degree to hybridity, and is therefore essentially different from that of *Rubus* or *Rosa*. It seems to result mainly from the inherently plastic nature of the plant's organism and to its frequently extreme susceptibility to the conditions of environment. This is

easily seen under cultivation, where a notable feature is the irregularity of the modifications effected. Some species, such as some of the *Oreadea*, maintain their characters under great changes of surroundings; others under liberal treatment quickly attain a vegetative luxuriance that renders them scarcely recognizable; others again, which in the wild state seem closely allied, respond quite differently to cultural stimulus and become widely different. With these naturally variable inherent characteristics, and subject to changing climatic and other conditions through long ages, the British hawkweeds, aided by occasional hybridization and mutations of form, seem to have gradually reached their present polymorphic condition. Hybrids or mutants would become fixed by their parthenogenetic reproduction. The method of seed-disposal is an important factor in their distribution. As in many other Compositae, the provision of pappus to the fruits supplies the means of wind-transport, but the efficacy of this agency is limited owing to the necessity of an open association for the germination of the seed. This necessity is seen in the general growth of all hawkweeds on mountain-ledges, in rock-clefts, on river banks, or on bare, stony or sandy ground. It accounts too for the occasional abundance of a few species on railway banks and tipplings. Thus in natural habitats *Hieracia* rarely spread rapidly and become common weeds, as do some species of *Taraxacum* and *Crepis*. The vitality of their seeds probably quickly diminishes. Occasionally, seeds may be accidentally carried by birds or by human agency, and start new colonies, which may cause apparent anomalies of distribution.

It is reasonable to suppose that our earliest hawkweeds, like most other flowering plants, were introduced at a time when Britain was united with the Continent. The south-east of England is separated from France and the Netherlands by a shallow sea usually less than twenty fathoms in depth, and a land connection, at least across the Strait of Dover, existed in a comparatively recent geological period. The North Sea, south of a line from Aberdeen to the Skager-rack, does not exceed a depth of fifty fathoms, and although a narrow but deep channel exceeding five hundred fathoms extends southward along the Norwegian coast, yet off the Naze this channel becomes shallower, and an earlier land extension across the North Sea from Denmark and Southern Norway is indicated, by which plants may have spread westwards. The sea separating Great Britain from Ireland, though narrow, is more than fifty fathoms deep nearly continuously from north to south, and the union of Ireland with Great Britain is probably more remote. To the north of Ireland an area of sea less than fifty fathoms in depth almost reaches and quite surrounds the Outer Hebrides; and a similarly relatively shallow sea extends northwards from Caithness and Sutherland to include both the Orkneys and Shetlands though not the Faeroes. These comparative shallows may be the sites of former land extensions. French or Central European hawkweeds might therefore be expected to occur especially in the south-east of England; Scandinavian or Danish species might be looked for in the north of England or Scotland; and Irish species would seem to have originally arrived mainly by way of Scotland or Wales. Of the sixty-nine British species shown by Zahn as common to this country and the Continent, three (*Amplexicaulia*) are undoubtedly recently introduced plants in Britain, and one (*H. nigrescens* Willd.) is of uncertain occurrence here. The remainder may be treated as natives. Of those seventeen are French or Central European plants; thirty-one inhabit Scandinavia; and seventeen are said to grow both in Central Europe and Scandinavia. These will now be dealt with in some detail. The preponderance of Scandinavian species will be noticed.

Of the total number of 249 British species, the table shows 184 to grow in North Britain (138 in the Scottish Highlands, 41 in southern Scotland and 79 in northern England), 93 in Wales, 39 in the Midlands, 32 in southern England and 48 in Ireland. These numbers indicate the predominance of hawkweeds in the mountainous parts of Great Britain, and as might be expected, their relative paucity in Ireland. Among the species recognized as common to Britain and the Continent, nine of the seventeen Central European plants occur solely or chiefly in mid or southern England; of the

remaining eight, two (*H. lasiophyllum* and *H. vagum*) are of general occurrence in Great Britain though not known south of the Thames ; three others (*H. buglossoides*, *H. Jovimontis* and *H. latobrigorum*), which are Scottish, may have been wrongly identified as British by Zahn ; *H. denticulatum* is perhaps an introduced plant in Scotland ; and the remaining two (*H. daedalolepioides* and *H. sublactucaceum*), both not well defined forms, grow wholly or mainly in Wales. Of the thirty-one Scandinavian species, twenty-nine are found in Scotland or the north of England, and of these, one alone (*H. pellucidum*) is known in southern England, and there from a single vice-county only, and only two (*H. pellucidum* and *H. stictophyllum*) are in the Midlands ; the two remaining (*H. Stenstroemii* and *H. trichocaulon*), which may have been wrongly identified, are confined to Wales or southern England. Of the seventeen British species common to both Central Europe and Scandinavia, eight are known only from Scotland or the north of England ; three (*H. diaphanoides*, *H. umbellatum* and *H. tridentatum*) are generally distributed except that the last-named does not reach Scotland ; four grow either in Scotland or northern England and in Wales ; one, a doubtful plant (*H. lissolepium*), is Welsh ; and one (*H. lepidulum*), of uncertain status, is confined to the south of England.

It thus appears that more than half of the purely Central European species are mainly plants of southern England or the Midlands, that the Scandinavian species are overwhelmingly plants of Scotland or the north of England, and that of the species known both for Central Europe and Scandinavia about half are definitely North British. This approximates to what might be expected from the geological record.

Of the forty-eight Irish species fifteen are Continental, a proportion nearly equal to that for Great Britain. Six are Central European plants, six Scandinavian, and three (*H. Schmidtii*, *H. vulgatum* and *H. umbellatum*) common to Central Europe and Scandinavia. There are eight Irish endemic species, six confined to northern Ireland, and two in Kerry, of which one grows also in Donegal. Of the remaining forty species, thirty-eight grow in North Britain, and twenty-four of them are wholly or chiefly Scottish Highlands plants. In Ireland these forms are found chiefly in the north. Two species (*H. sanguineum* and *H. bichlorophyllum*) grow in Ireland that are in Wales but not in North Britain. Only nine Irish species are known in the south of England, and all of these occur also in Wales ; they are plants widely distributed in Great Britain, and six of them are Continental. The *Hieracium* flora of Ireland thus seems to be chiefly connected with or derived from that of Scotland, with a smaller number of species arriving through Wales. This again accords with what may be anticipated from the local geology.

The proportions of endemic species in the different parts of the British Isles are also significant. In North Britain (Scotland and the north of England) 86 out of 184 species (rather less than one half) are endemic to that district ; in Wales 28 out of 93 (rather less than one third) ; in the Midlands 2 out of 39 (barely 1/19th) ; in the south of England 5 out of 32 (rather less than one sixth) ; and in Ireland 8 out of 48 (one sixth). In addition there are 51 species endemic to Britain that are known from more than one district. Twelve of these are common to North Britain and Ireland, twelve to North Britain and Wales, and eleven are found in the three districts. Of the residual sixteen the majority grow in Wales and either the Midlands (often just across the Welsh border) or the south of England. No species is confined to Ireland and mid or southern England. The preponderance of endemics in North Britain, where the total number of species is greatest, is remarkable. In Wales, where, considering the area, the number is also considerable, the proportion of endemics is markedly less, and in southern England, with a relatively small number of species, the proportion is only one-third as great. This suggests that the genus must have existed through a much longer period in the north than in the south of Great Britain. The low proportion of endemics in Ireland probably needs a somewhat different explanation. In addition to the eight species endemic to Ireland, twelve British endemics are common to Ireland and North Britain, and eleven others to Ireland, North Britain and Wales. Two species are known for Ireland and Wales.

but not from North Britain, and only three that occur in Ireland (*H. britannicum*, *H. anglorum* and *H. bichlorophyllum*) are found in the south of England. The close relationship of the *Hieracium* flora of Ireland with that of North Britain is thus emphasized by the prevalence of so many North British endemics. The paucity of species in Ireland, as in the case of other genera, may be attributed to the relative isolation of the country.

While some species of *Eu-Hieracium* are rare or local plants in Britain, sometimes known only from a single habitat, others are widely distributed. This is true both of Continental and of endemic forms. 85 species (69 endemic) are known from 1 vice-county only; 63 (49 endemic) inhabit 2-4 vice-counties; 53 (38 endemic) grow in 5-9 vice-counties; 28 (18 endemic) are found in 10-20 vice-counties; 19 (6 endemic) are in more than 20 vice-counties. Endemics are thus commonest among the rare or local species and fewest among those with the widest distribution.

Further points of interest arise in analysing the separate generic Sections. The species of the *Amplexicaulia*, being of comparatively recent introduction, call for no comment. The *Alpina*, of which about one half of the species are endemic, are almost restricted to the Scottish Highlands, two only reaching the English Lakes district and one North Wales. Their origin is evidently Scandinavian. Though a large proportion of them grow in several vice-counties, only two, neither endemic, can be termed widely distributed plants, taking occurrence in eight or more vice-counties to constitute this category. The *Subalpina*, a group of fifteen species with all but three endemic, are similarly restricted to Scotland, except one species found in the Lake District, and one very rarely indeed in northern Ireland. Only two, both endemic, are widely spread, though eight others grow in three or more vice-counties. Like the *Alpina*, they are probably of Scandinavian origin, and perhaps the product of species of the *Alpina* crossed with *Cerinthoidea*, *Oreadea* or *Vulgata*. The distribution of the next group *Cerinthoidea* is much more suggestive. This Section is not represented either in Central Europe or Scandinavia, and seems to range from northern Spain through the Pyrenees to the south-western Alps, appearing again in the Faeroes and Iceland. In Britain, where its eleven species are all endemic, it extends over Ireland and North Britain, southwards to Yorkshire and northwards to the Outer Hebrides and Orkneys, but not the Shetlands. It is absent from Wales and from mid and southern England. Its British range thus forms a connecting link between the Lusitanian and Faeroan areas. The two strongly marked species, *H. anglicum* and *H. iricum*, inhabit 39 and 27 British vice-counties respectively (including Ireland), and *H. langwellense*, *H. flocculosum* and *H. Shoolbredii* are also widely spread. A striking fact is the occurrence of seven species in the Outer Hebrides, which should be remembered in connection with the prevalence of the group in the Faeroes and Professor Heslop Harrison's recent discoveries in other genera. Among the *Oreadea* the commonest species are *H. lasiophyllum* (22 vice-counties), of Central Europe, *H. argenteum* (33 v.-c.'s) and *H. Sommerfeltii* (13 v.-c.'s), both Scandinavian plants, and *H. Schmidtii* (20 v.-c.'s), of Central Europe and Scandinavia. The endemics *H. nitidum*, *H. scoticum* and *H. chloranthum* are also widely distributed. This Section shows an almost equal development in North Britain and in Wales, and seems to be of mixed origin. Two species, both endemic, grow in the south of England, in Devon and Somerset; and there are seven species in Ireland. The *Sub-Oreadea* are all endemic plants, excepting *H. Jovimontis*, about whose identity as a Scottish plant there is some uncertainty. While chiefly North British they are well represented in Wales, and four species grow in Ireland. There are two species at Cheddar, in Somerset. The plants of this group seem likewise of mixed origin. Coming to the large group *Vulgata*, the first Subsection *Bifida* consists of thirteen rather rare species, all endemic except *H. maculosum* and *H. prolixum*, which are both found in Central Europe and in Scandinavia. Ten of the species are confined to North Britain: two occur in Wales, one of these also inhabiting Ireland; and one, *H. pachyphyllum*, is endemic in the West Midlands. There are none in southern

England. The two species of the next Subsection *Stellatifolia* are rare endemics of the north of England and Wales. The following Subsection *Glandulosa* is somewhat heterogeneous and obviously of mixed origin. The commonest species, *H. exotericum* (42 v.-c.'s) is an abundant plant in Central Europe, and predominates in the Midlands and south of England, growing in fifteen vice-counties south of the Thames. It may have been introduced in its two Scottish stations. *H. praecox*, a second Central European species, is perhaps a recent introduction in Surrey. *H. pellucidum* (18 v.-c.'s), of Scandinavian origin according to Zahn, is curiously absent from Scotland though well represented in the north of England as well as the Midlands and Wales. Fifteen of the remaining eighteen species of the group are plants of North Britain, all endemic but five which are Scandinavian. Excepting *H. killinense*, *H. pictorum* and *H. varicolor*, they are all uncommon, nine being recorded only from a single vice-county. The remaining three species are Welsh endemics. Three species of the group are known in Ireland. The next Subsection *Sagittata* is mainly of Scandinavian affinity, although only two of its twelve species are Scandinavian and not endemic. All of its species grow in North Britain, except *H. clivicolum*, which is Welsh: two endemics, *H. rivale* and *H. euprepes*, are widely spread, the latter being the only member of the group found in Ireland. The Subsection is not represented in the south of England. The species (23) of the large Subsection *Caesia* are all endemic except six, which are Scandinavian. Three only, *H. vennicontium*, *H. caesiomurorum* and *H. cravoniense*, are widely distributed, and nine are known from a single vice-county. All but two (*H. Leyianum*, chiefly Welsh, and *H. angustisquamum*, growing at Cheddar) are plants of North Britain, although six are found also in Wales. Four species are known from Ireland. This group is predominantly North British and probably chiefly Scandinavian in origin. The last Subsection, *Eu-Vulgata*, embraces 22 species, whereof twelve are endemic. The remaining ten are Central European, or Central European and Scandinavian, except *H. acroleucum*, which is exclusively Scandinavian. Three species only grow in Scotland: there are twelve in southern England and in the Midlands, fifteen in Wales and four in Ireland. The most abundant species, *H. vulgatum*, is recorded for 53 vice-counties, of which 31 are in Scotland, and is unknown in the south of England. Although credited to Central Europe by Zahn as well as to Scandinavia, the British plant seems to have been derived from the latter region. Two other common species are *H. Lachenalii* (48 v.-c.'s), a plant of Central Europe, and *H. anglorum* (40 v.-c.'s) which is endemic. Neither of these is known in Scotland, and both are widely spread in the Midlands and south of England, as well as in Wales. The affinity of both is clearly Central European. *H. maculatum* (Central European), *H. subamplifolium* (endemic) and *H. diaphanoides* (Central European and Scandinavian) are also widely distributed. The only species of this Subsection, besides *H. vulgatum*, that seem to be of Scandinavian affinity are *H. acroleucum*, *H. neopinnatifidum*, *H. diaphanum*, *H. praesigne* and *H. diaphanoides*.

Turning to the Transitorian and Aphyllopodous Sections, the *Alpestris* are peculiar in that ten of their thirteen species are confined to Shetland, where they are endemic though generally allied to Scandinavian forms. One Scandinavian species, *H. dovrense*, has a solitary station in Northern Scotland, and the remaining two members of the group, *H. Dewarii* and *H. perthense*, are endemic Scottish plants which differ considerably from the other species of the Section and may not have been rightly placed. Of the *Prenanthoidea*, *H. prenanthoides* is widely spread in North Britain and occurs rarely in Wales. Its origin with us is probably Scandinavian. The second species, *H. denticulatum*, is of uncertain status in Britain. The next Section, *Tridentata*, is a large (34 species) and somewhat heterogeneous one. Twenty-six of its species bear some resemblance to *H. gothicum*; the remaining eight are connected with *H. tridentatum*. Of the first group all are endemic but four, which are Scandinavian and with us chiefly North British. Of the twenty-two endemics, six are in North Britain (three exclusively), ten in Wales (of which seven

are not known elsewhere) and nine in Ireland, whereof seven are confined to that country. Fourteen are rare plants, known from one or two vice-counties only, and seven of these are Irish. The Scandinavian *H. boreophilum*, *H. sparsifolium* and *H. grandescens* are likewise confined to one or two vice-counties. The only common species of the group is the Scandinavian *H. stictophyllum* (26 v.-c.'s), and of the rest the endemic *H. Backhouseanum* alone is well distributed. The group appears to be of more or less Scandinavian affinity, and is notable for the number of its Welsh and Irish endemics. Of the eight species of *Eu-Tridentata*, five are endemic, *H. tridentatum* and *H. lissolepium* are both Central European and Scandinavian, and *H. trichocaulon* Scandinavian. None of these plants is known from Scotland, with the solitary exception of a single record for the Outer Hebrides, and none from Ireland. Seven are in Wales, three in the Midlands, and four in southern England. Two species are locally common, *H. tridentatum* (27 v.-c.'s) and the endemic *H. eboracense* (21 v.-c.'s). Two other endemic species are restricted to a single Welsh vice-county. *H. trichocaulon*, which grows in eight vice-counties in southern England, may have been wrongly identified with the Scandinavian plant. The species of *Eu-Tridentata* are evidently mainly of Central European origin. Of the Section *Foliosa* three species, *H. reticulatum*, *H. opsianthum* and *H. pycnotrichum* are Scandinavian, *H. latobrigorum*, according to Zahn, is Central European, and the remaining twelve are endemic. All but one of them (the Welsh *H. tavense*) occur in North Britain, six being confined to that district; eight are known in Wales; and six are in Ireland. Several are more or less common species, especially in the Scottish Highlands, as *H. latobrigorum* (27 v.-c.'s), *H. strictiforme* (23 v.-c.'s), *H. reticulatum* (18 v.-c.'s), *H. neocorymbosum* (14 v.-c.'s), *H. Bartonii* (11 v.-c.'s) and *H. pseudamplidentatum* (10 v.-c.'s). No form is known in the south of England, and one only, *H. latobrigorum*, from Stafford in the Midlands. From their British distribution the *Foliosa* would seem to be clearly of Scandinavian origin, and the identity of our *H. latobrigorum* with a Central European species may be questioned. Coming to the Section *Umbellata*, the dominant species, *H. umbellatum*, known throughout Europe, is spread over the whole of the British Isles (79 v.-c.'s) although less general in the north. The two remaining species, *H. ogweni* and *H. bichlorophyllum*, are endemics, the former a very rare plant of North Wales and the latter rather widely scattered over southern England, Wales and Ireland. The last Section *Sabauda* consists of eleven species, of which six are Central European and five are endemic in Wales, Yorkshire or S.W. England. Three only, *H. Bladonii*, *H. vagum* and *H. sublactucaceum*, extend to North Britain, and one only (*H. Bladonii*) to Ireland. Nine species grow in Wales, and six (two extensively) in the Midlands and south of England. Three are relatively common plants, *H. Bladonii* (47 v.-c.'s), *H. perpropinquum* (23 v.-c.'s), and *H. vagum* (38 v.-c.'s). Although the greatest number of species is known from Wales, yet the general frequency of these plants in the Midlands and south of England is such that the group seems conclusively to have spread from Central Europe.

A feature that may be mentioned in connection with distribution is the occurrence of rare and sometimes very distinct endemic species in restricted (sometimes presumably unglaciated) areas notable for producing rarities of other genera. Such are *H. auratiflorum* and *H. Bakeranum* of Upper Teesdale, *H. cambricum*, *H. britanniciforme*, *H. decolor* and *H. holophyllum* of Great Orme's Head, and *H. lima*, *H. cyathis* and *H. angustisquamum* of Cheddar. Other further similar associations might be cited from Scotland and Ireland.

The facts elucidated may now be summarized. In Britain, while in *Pilosella* the number of species is very small, in *Eu-Hieracium* the number is very large. Of 249 described species of *Eu-Hieracium*, 184 grow in North Britain, 93 in Wales, 39 in the Midlands, 32 in the south of England, and 48 in Ireland. Thus the largest number inhabits the mountainous parts of Great Britain; and in Ireland, though the country is almost equally mountainous, the number is relatively small, owing

at least in part, to its greater insularity. Sixty-nine of the British species are shown by Zahn as growing on the Continent, of which thirty-one are Scandinavian and the remainder Central European or occurring both in Central Europe and in Scandinavia. The Central European species are most prevalent in Southern England or may extend into Wales, suggesting a French or Central European derivation. The Scandinavian species overwhelmingly predominate in North Britain, indicating an origin across the North Sea. In Ireland a large proportion of species are also North British, from which it may be inferred that the Irish *Hieracium*-flora is closely related to that of Scotland. There are 180 presumably endemic species in Britain. Of these 86 are confined to North Britain, rather less than half the total number of species known in the district; in Southern England there are only five endemics out of a total of 32 species (less than one sixth). The larger number of species and the greater proportion of endemics in the north suggests that the immigration from Scandinavia was earlier than that from France. British species, continental and endemic, vary greatly in range and abundance; endemics seem to be most frequent among the rare or local species.

Taking the Sections *seriatim*, the *Alpina* and *Subalpina*, now plants of the mountains, appear to have arrived from Scandinavia across low country, now covered by the North Sea, at a time when the climate was severe or subarctic and an open association of vegetation was generally prevalent. The affinity of the *Cerinthoidea* seems to be clearly Lusitanian, and their distribution should be considered in conjunction with that of other Lusitanian genera. The occurrence of species through Ireland and North Britain to the Orkneys and Outer Hebrides is noteworthy as connecting the Faeroan species of the group with those of the Iberian Peninsula. The *Oreadea* and *Sub-Oreadea* are apparently of mixed origin. The *Vulgata* are mainly Scandinavian, except certain species of the Subsection *Glandulosa* and most of the *Eu-Vulgata*, which are Central European. The *Alpestris*, *Prenanthoidea* and *Foliosa* are clearly Scandinavian. Of the large Section *Tridentata*, most of the species seem of Scandinavian affinity, but the *Eu-Tridentata* are Central European, as are also the *Sabauda*. The *Umbellata* also probably spread over Britain from the south.

In the second edition of Wallace's 'Island Life' (1892), the sixteenth chapter deals with endemism in the British Isles and (pp. 360–363) gives a list of seventy-five species, subspecies and varieties of British flowering plants 'not at present known in Continental Europe'. The list was compiled by Arthur Bennett and was criticized by Sir Joseph Hooker, who reduced the list to four species (one (*Potamogeton lanceolatus*) endemic and three North American) and sixteen endemic varieties. Bennett's list included fifteen species of *Hieracium*, of which Hooker says 'No case can be made of these. They are local forms with the shadowest [sic] of shady characters'. This pronouncement appeared in print when Hanbury and the Lintons were actively working on the genus and Hanbury's Monograph was in course of publication. Although no doubt largely taken at the time at its face-value, it now appears simply as the arbitrary ruling of a great botanist who had never studied or acquired any accurate knowledge of the plants he so cursorily dismissed as the 'shadowest' of shady local forms. It has become generally recognized that the study of the so-called critical genera of plants is of high importance in attempting the solution of phytogeographical problems and the relationships of past and present floras, and the facts now brought to light show that the distribution of the British *Hieracia* may have some important bearings on such questions and that, among the host of endemic British species, there are some that are very distinct, widely spread and really not critical plants at all. The whole list furnished by Bennett, like Hooker's revision, serves now but to illustrate the progress that has been made in the study of British flowering plants during the last half-century.

Table showing distribution of British Hieracia
(*Subgenus Eu-Hieracium*) and the numbers of their vice-counties.

Endemic species in italics. !=Species collected by the writer *in situ*. N.S.=Scotland N. of Lanark and Linlithgow but including Cantyre. O.H. or Sh.=Outer Hebrides or Shetlands, numbers included under N.S. S.S.=South Scotland, including Clyde Isles. N.E.=North England, including Cheshire and Derby. M.E.=Midlands, N. of the Thames and including Gloucester. S.E.=Southern England.

Species.	Foreign.	O.H. N.S. or Sh.	S.S.	N.E.	M.E.	Wales.	S.E.	Ire- land.	
<hr/>									
Sect. <i>Amplexicaulia</i>									
<i>amplexicaule</i> !	Central Europe	1	—	—	1	1	—	—	
<i>pulmonarioides</i> !	Central Europe	1	—	—	3	—	—	—	
<i>speluncarum</i> !	Central Europe	2	—	—	—	1	—	1	
<hr/>									
Sect. <i>Alpina</i>									
<i>alpinum</i> !	{ Scandinavia Central Europe	4	—	—	—	—	—	—	
<i>holosericeum</i> !	{ Scandinavia Central Europe	10	—	1	2	—	1	—	
<i>Grovesii</i>		1	—	—	—	—	—	—	Cairngorms only.
<i>eximium</i> !	{ Scandinavia Central Europe	9	—	—	—	—	—	—	
<i>calenduliflorum</i> !	{ Scandinavia Central Europe	6	—	—	—	—	—	—	
<i>macrocarpum</i>		1	—	—	—	—	—	—	Cairngorms only.
<i>graniticolum</i>		2	—	—	—	—	—	—	
<i>gracilentum</i> !	Scandinavia	6	—	—	—	—	—	—	
<i>globosiflorum</i>	Scandinavia	5	—	—	—	—	—	—	
<i>pseudo-petiolatum</i>		1	—	—	—	—	—	—	Cairngorms only.
<i>Backhousei</i> !		6	—	—	—	—	—	—	
<i>nigrescens</i>	Germany	—	—	—	—	—	—	—	British?
<i>pseudo-curvatum</i> !		6	—	—	—	—	—	—	
<i>Hanburyi</i> !		7	—	—	—	—	—	—	
<i>subgracilentipes</i> !		1	—	—	1	—	—	—	
<hr/>									
Sect. <i>Subalpina</i>									
<i>lingulatum</i> !		11	—	—	—	—	—	—	
<i>molybdochroum</i>	Scandinavia	1	—	—	—	—	—	—	Cairntoul.
<i>Marshallii</i>		4	—	—	—	—	—	—	
<i>cremnanthes</i>		5	—	—	—	—	—	—	
<i>sinuans</i> !		5	O.H.	—	—	—	—	—	Barra (O.H.).
<i>senescens</i> !		7	—	—	—	—	—	1	
<i>pseudanglicum</i> !		1	—	—	—	—	—	—	Mid Perth.
<i>gracilifolium</i> !	{ Scandinavia Central Europe	5	—	—	—	—	—	—	
<i>submurorum</i>	Scandinavia	1	—	—	—	—	—	—	Kingshouse.
<i>cumbriense</i>		—	—	—	2	—	—	—	
<i>centripetale</i>		4	—	2	—	—	—	—	
<i>hyparcticoides</i>		1	—	—	—	—	—	—	Inchnadamph.
<i>Isabellae</i> !		3	—	—	—	—	—	—	
<i>callistophyllum</i> !		3	—	—	—	—	—	—	
<i>dasythrix</i> !		3	—	—	—	—	—	—	
<hr/>									
Sect. <i>Cerinthoidea</i>									
<i>anglicum</i> !		16	O.H.	2	5	—	—	—	16
<i>brigantum</i> !		—	—	—	1	—	—	—	Yorks.
<i>ebudicum</i>		1	O.H.	—	—	—	—	—	Only in O.H.
<i>hebridense</i>		1	O.H.	—	—	—	—	—	Only in O.H.
<i>ampliatum</i> !		—	—	—	5	—	—	—	Antrim.
<i>petrocharis</i> !		4	—	—	—	—	—	—	
<i>langwellense</i> !		7	—	1	—	—	—	—	
<i>flocculosum</i> !		9	O.H.	—	—	—	—	—	
<i>Shoolbredii</i> !		11	O.H.	—	—	—	—	—	
<i>iricum</i> !		12	O.H.	1	2	—	—	—	12
<i>scurpicum</i>		1	O.H.	—	—	—	—	—	Only in O.H.

Species.	Foreign.	O.H. N.S. or Sh.	S.S.	N.E.	M.E.	Wales.	S.E.	Ire- land.	
Sect. <i>Oreadea</i>									
<i>lima</i> !		—	—	—	—	—	1	—	Cheddar.
<i>lasiophyllum</i> !	Central Europe	5	—	1	4	4	6	—	2
<i>eustoma</i> !		—	—	—	—	1	4	3	—
<i>Schmidtii</i> !	{ Scandinavia Central Europe	10 O.H. & Sh.	2	3	—	2	—	3	—
<i>Leyi</i> !		—	—	1	3	—	2	—	—
<i>nitidum</i> !		7 O.H.	—	—	—	3	—	—	—
<i>basicrinum</i>		2	—	—	—	—	—	—	—
<i>Sommerfeltii</i> !	Scandinavia	10	—	1	1	—	—	—	1
<i>carneodorum</i> !		—	—	—	—	3	—	—	—
<i>argenteum</i> !	Scandinavia	16 O.H.	3	4	—	5	—	5	—
<i>vagense</i> !		—	—	—	—	3	—	—	—
<i>canbriacum</i> !		—	—	—	—	3	—	—	—
<i>Griffithii</i>		—	—	—	—	2	—	—	—
<i>deganwegense</i> !		—	—	1	—	1	—	—	—
<i>buglossoides</i>	Central Europe	2	—	—	—	—	—	—	—
<i>scolicum</i> !		6 O.H.	—	1	—	1	—	2	—
<i>chloranthum</i> !		10	—	—	—	—	—	—	—
<i>Berberyanum</i>		3 O.H. & Sh.	—	—	—	—	—	3	—
<i>orimeles</i> !		—	—	1	—	—	2	—	2
Sect. <i>Sub-Oreadea</i>									
<i>rubicundum</i> !		6 O.H.	1	2	1	2	—	5	—
<i>caledonicum</i> !		7 O.H.	—	—	—	—	—	—	—
<i>pseudo-repandum</i>		—	—	—	—	2	—	—	—
<i>Riddelsdellii</i>		—	—	—	—	1	—	—	—
<i>basalticum</i> !		—	—	—	—	—	—	2	—
<i>Jovimontis</i> !	Central Europe	7 O.H.	—	—	—	—	—	—	—
<i>cyathis</i> !		—	—	—	—	1	1	—	—
<i>hypochaeroides</i> !		3	—	—	3	1	4	—	2
<i>subplanifolium</i>		—	—	—	1	2	—	—	—
<i>britannicum</i> !		2	—	1	4	3	3	1	3
<i>dasypodum</i>		1	—	—	—	—	—	—	—
<i>britanniciforme</i> !		—	—	—	1	—	1	—	—
<i>clovense</i> !		4 O.H.	1	—	—	—	—	—	—
<i>fratrum</i>		—	—	1	—	—	—	—	—
Sect. <i>Vulgata</i>									
Subsect. <i>Bifida</i>									
<i>pachyphyllum</i>		—	—	—	—	2	—	—	—
<i>sanguineum</i> !		—	—	—	—	—	1	—	1
<i>tricolorans</i> !		—	—	—	3	—	—	—	—
<i>subcyanum</i> !		—	—	—	2	—	—	—	—
<i>silvaticoides</i> !		—	—	—	3	—	—	—	—
<i>maculosum</i> !	{ Scandinavia Central Europe	—	—	—	1	—	—	—	—
<i>pseudo-sarcophyllum</i>		—	—	1	—	—	—	—	—
<i>anguinum</i>		—	—	1	—	—	—	—	—
<i>neocoracinum</i>		—	—	—	—	1	—	—	—
<i>prolixum</i>	{ Scandinavia Central Europe	1	—	—	—	—	—	—	—
<i>subtenue</i>		6	—	—	—	—	—	—	—
<i>aggregatum</i> !		5	—	—	—	—	—	—	—
<i>oxyodus</i> !		1	—	—	—	—	—	—	—
Subsect. <i>Stellatifolia</i>									
<i>cillense</i>		—	—	—	—	1	—	—	—
<i>cymbifolium</i> !		—	—	—	2	1	—	—	—
Subsect. <i>Glandulosa</i>									
<i>praecox</i> !	Central Europe	—	—	—	—	—	1	—	—
<i>duriceps</i>		3	—	—	—	—	—	—	—
<i>killinense</i> !		10	—	3	4	—	—	4	—
<i>praetenerum</i>	Scandinavia	1	—	—	1	—	—	—	—
<i>pellucidum</i> !	Scandinavia	—	—	—	6	5	4	1	2

Species.	Foreign.	N.S.	O.H. or Sh.	S.S.	N.E.	M.E.	Wales.	S.E.	Ire- land.	
<i>Stenstroemii</i>	Scandinavia	—	—	—	—	—	1	—	—	Brecon.
<i>exotericum</i> !	Central Europe	1	—	1	3	10	6	16	5	Stirling and Rox- burgh in Scotland.
<i>cuneifrons</i>		—	—	—	—	1	2	—	—	Monmouth.
<i>pulcherrimum</i> !		—	—	—	—	—	1	—	—	Carnarvon.
<i>itunense</i>		—	—	—	1	—	—	—	—	Westmorland.
<i>pollinarium</i>		1	—	—	—	—	—	—	—	Sutherland.
<i>pictorum</i> !		8	—	—	—	—	—	—	—	
<i>pollinarioides</i>		1	—	—	—	—	—	—	—	Sutherland.
<i>caliginosum</i>	Scandinavia	1	—	—	—	—	—	—	—	Sutherland.
<i>subprasiniifolium</i>		—	—	—	1	—	—	—	—	Derby.
<i>pseudo-Stenstroemii</i> !		—	—	—	1	—	—	—	—	Yorks.
<i>longilobum</i>	Scandinavia	—	—	1	—	—	—	—	—	Moffat.
<i>semi-crassiceps</i>		1	—	—	—	—	—	—	—	Forfar.
<i>ciliatiflorum</i> !	Scandinavia	3	—	—	1	—	—	—	—	
<i>varicolor</i> !	Scandinavia	8	—	—	1	—	—	—	—	
<i>dipteroides</i>		1	—	—	—	—	—	—	—	Perth.
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Subsect. <i>Sagittata</i>										
<i>oistophyllum</i> !	Scandinavia	5	—	1	3	—	—	—	—	
<i>pycnodon</i>	Scandinavia	1	—	—	—	—	—	—	—	Orkney.
<i>subhirtum</i> !		5	—	1	—	—	—	—	—	
<i>rivale</i> !		10	—	—	1	—	—	—	—	
<i>uisticolum</i>		1	O.H.	—	—	—	—	—	—	Only in O.H.
<i>breaddabanense</i> !		2	—	—	—	—	—	—	—	
<i>crebridentiforme</i> !		—	—	—	1	—	—	—	—	Yorks.
<i>auratiflorum</i> !		—	—	—	2	—	—	—	—	
<i>Lintonii</i> !		—	—	—	2	—	2	—	—	
<i>euprepes</i> !		6	—	1	—	2	3	—	2	W. Midlands.
<i>orcadense</i>		1	—	—	—	—	—	—	—	Orkney. [marthen.
<i>clivicolum</i>		—	—	—	—	—	2	—	—	Brecon and Car-
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Subsect. <i>Caesia</i>										
<i>angustatum</i>	Scandinavia	2	—	—	2	—	1	—	—	
<i>rhomboides</i>	Scandinavia	1	—	—	1	—	—	—	—	
<i>melanochloricephalum</i>		1	—	—	—	—	—	—	—	Cairntoul.
<i>stenophyes</i>		—	—	1	—	—	—	—	—	Moffat.
<i>vennicontium</i> !		9	O.H.	—	1	—	—	—	1	Down in Ireland.
<i>anfractiforme</i>		4	—	—	—	—	—	—	—	
<i>caesiomurorum</i> !	Scandinavia	10	O.H.	—	—	—	1	—	—	
<i>dissimile</i>	Scandinavia	6	—	—	—	—	—	—	—	
<i>subramosum</i>	Scandinavia	1	—	—	—	—	—	—	—	Fife.
<i>orarium</i>	Scandinavia	1	O.H.	—	3	—	—	—	1	Antrim in Ireland.
<i>cravoniense</i> !		9	O.H.	1	5	—	—	—	—	[land.
<i>rubiginosum</i> !		1	—	—	4	—	2	—	—	Caithness in Scot-
<i>caesiopilosum</i> !		—	—	—	1	—	—	—	—	Teesdale.
<i>decolor</i> !		—	—	—	1	—	1	—	—	
<i>fulvocaesium</i>		1	—	—	—	—	—	—	—	Sutherland.
<i>erythraeum</i>		1	—	—	—	—	—	—	—	Sutherland.
<i>farrense</i> !		5	—	—	1	—	—	—	3	
<i>proximum</i> !		1	—	—	1	—	—	—	4	
<i>angustisquamum</i> !		—	—	—	—	—	—	1	—	Cheddar.
<i>eustales</i>		1	—	—	—	—	—	—	—	Perth.
<i>insulare</i>		1	—	—	—	—	—	—	—	Perth.
<i>Leyianum</i> !		—	—	—	—	2	1	—	—	W. Midlands.
<i>holophyllum</i> !		—	—	—	2	—	1	—	—	
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Subsect. <i>Eu-Vulgata</i>										
<i>vulgatum</i> !	Scandinavia	21	O.H.	10	10	3	6	—	4	
<i>acroleucum</i>	Central Europe	—	—	—	3	—	1	—	—	
<i>neopinnatifidum</i>	Scandinavia	—	—	—	1	1	1	—	—	
	Central Europe	—	—	—	—	—	—	—	—	
<i>lepidulum</i> !	Scandinavia	—	—	—	—	—	—	2	—	Surrey and Hants.
	Central Europe	—	—	—	—	—	—	—	—	
<i>maculatum</i> !	Central Europe	—	—	—	3	6	1	6	2	Louth and Leix in
<i>Roffeyanum</i>		—	—	—	—	—	—	2	—	[Ireland.

Species.	Foreign.	N.S.	O.H. or Sh.	S.S.	N.E.	M.E.	Wales.	S.E.	Ire- land.	
<i>surrejanum</i> !		—	—	—	—	2	1	3	—	W. Midlands.
<i>megapodium</i> !		—	—	—	—	—	—	2	—	Sussex and Kent.
<i>subamplifolium</i> !		—	—	—	—	4	4	1	—	W. Midlands.
<i>subminutidens</i>		—	—	—	—	—	1	—	—	Brecon.
<i>diaphanum</i>	{ Scandinavia	—	—	—	1	—	—	—	—	S. Lancs.
	{ Central Europe	—	—	—	—	—	—	—	—	
<i>praesigne</i> !		2	—	1	3	—	—	—	—	
<i>diaphanoides</i> !	{ Scandinavia	4	—	—	3	1	3	1	—	Carmarthen.
	{ Central Europe	—	—	—	—	—	—	—	—	
<i>rectulum</i>		—	—	—	—	—	1	—	—	Leicester.
<i>pulchrius</i>		—	—	—	—	—	2	—	—	
<i>submutabile</i> !		—	—	—	—	1	4	—	—	
<i>daedalolepioides</i> !	Central Europe	—	—	—	1	2	4	—	—	
<i>anglorum</i> !		—	—	—	6	16	10	5	3	
<i>tunbridgense</i> !		—	—	—	—	—	—	3	—	
<i>Lachenalii</i> !	Central Europe	—	—	—	7	19	9	12	1	
<i>strumosum</i> !		—	—	—	—	4	4	2	—	
<i>acuminatum</i>	Central Europe	—	—	—	1	3	—	1	—	
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Sect. <i>Alpestris</i>										[land.
<i>dovrense</i>	Scandinavia	1	—	—	—	—	—	—	—	Ben Loyal, Suther-
<i>pulchelliforme</i>		1	Sh.	—	—	—	—	—	—	
<i>zelandicum</i>		1	Sh.	—	—	—	—	—	—	
<i>pseudo-protractum</i>		1	Sh.	—	—	—	—	—	—	
<i>hethlandiae</i>		1	Sh.	—	—	—	—	—	—	
<i>australius</i>		1	Sh.	—	—	—	—	—	—	
<i>subtruncatum</i>		1	Sh.	—	—	—	—	—	—	
<i>breve</i>		1	Sh.	—	—	—	—	—	—	
<i>praethulense</i>		1	Sh.	—	—	—	—	—	—	
<i>vinaceum</i>		1	Sh.	—	—	—	—	—	—	
<i>northroense</i>		1	Sh.	—	—	—	—	—	—	
<i>Dewarii</i> !		6	—	—	—	—	—	—	—	
<i>perthense</i>		2	—	—	—	—	—	—	—	
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Sect. <i>Prenanthoidea</i>										
<i>prenanthoides</i> !	{ Scandinavia	4	—	2	4	—	1	—	—	Selkirk.
	{ Central Europe	—	—	1	—	—	—	—	—	
<i>denticulatum</i>	Central Europe	—	—	—	—	—	—	—	—	
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Sect. <i>Tridentata</i>										
<i>cacuminum</i>		—	—	—	—	—	1	—	—	Brecon.
<i>hibernicum</i>		—	—	—	—	—	—	—	2	Down and Donegal.
<i>longiramosum</i>		—	—	—	—	—	1	—	—	Carnarvon.
<i>cambrico-gothicum</i> !		—	—	—	—	—	3	—	—	
<i>boreophilum</i>	Scandinavia	1	—	—	—	—	—	—	—	Perth.
<i>calcaricolum</i>		—	—	—	—	1	—	—	—	Glo'ster.
<i>fragilicaule</i>		—	—	—	—	—	4	1	—	
<i>calviceps</i> !		1	—	1	5	—	—	—	—	
<i>gothicoides</i> !		5	—	1	—	—	—	—	—	
<i>uiginskysense</i>		4	—	—	—	—	—	—	1	Antrim in Ireland.
<i>trinitatis</i>		—	—	—	—	—	1	—	—	Brecon.
<i>Backhouseanum</i> !		7	—	—	—	—	1	—	1	Galway in Ireland.
<i>pseudacrifolium</i>		—	—	—	—	—	2	—	—	
<i>Scullyi</i> !		—	—	—	—	—	—	—	1	Kerry.
<i>ardaricum</i>		—	—	—	—	—	—	—	1	Donegal.
<i>Stewartii</i>		—	—	—	—	—	—	—	1	Down.
<i>subintegrifolium</i> !		—	—	—	1	—	—	—	—	Westmorland.
<i>stictophyllum</i> !	Scandinavia	13	O.H.	3	2	1	6	—	1	
<i>sparsifolium</i>	Scandinavia	—	—	—	1	—	—	—	—	Cumberland.
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<i>oligodon</i>		—	—	—	—	—	—	—	2	Kerry and Donegal.
<i>linguans</i>		—	—	—	—	—	1	—	—	Brecon.
<i>substrigosum</i> !		—	—	—	—	—	5	—	—	
<i>donegalense</i>		—	—	—	—	—	—	—	1	Donegal.
<i>grandescens</i>	Scandinavia	—	—	—	1	—	1	—	—	
<i>placeroephylloides</i> !		—	—	1	3	—	2	—	—	

Species.	Foreign.	O.H. N.S. or Sh.					Ire- S.E. land.		
<i>Hartianum</i>		—	—	—	—	—	—	1	Donegal.
<i>tridentatum</i> !	{ Scandinavia	—	—	—	3	9	4	11	—
	Central Europe	—	—	—	—	—	3	—	—
<i>scabrisetum</i>		—	—	—	—	—	—	—	—
<i>cantianum</i> !		—	—	—	—	—	1	4	—
<i>nidense</i>		—	—	—	—	—	1	—	—
<i>trichocaulon</i> !	Scandinavia	—	—	—	—	1	—	8	—
<i>eboracense</i> !		1	O.H.	—	6	6	3	5	—
<i>rhayaderense</i>		—	—	—	—	—	1	—	—
		—	—	—	—	—	—	—	Radnor.
<i>lissolepium</i>	{ Scandinavia	—	—	—	—	—	2	—	—
	Central Europe	—	—	—	—	—	—	—	—
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Sect. <i>Foliosa</i>									[lands.
<i>latobrigorum</i> !	Central Europe	17	—	2	3	1	1	—	3
<i>Drummondii</i>		2	—	—	—	—	—	—	Stafford in Mid-
<i>neocorymbosum</i> !		8	O.H.	—	4	—	1	—	1
<i>suberocatum</i> !		—	—	2	3	—	2	—	Wicklow in Ireland.
<i>Bartonii</i> !		1	—	—	3	—	5	—	[trim in Ireland.
<i>subpolyphyllum</i>		1	—	—	—	—	—	—	2
<i>reticulatum</i> !	Scandinavia	16	—	1	—	—	1	—	Wicklow and An-
<i>strictiforme</i> !		13	O.H.	2	2	—	1	—	Orkney.
<i>opsianthum</i> !	Scandinavia	10	O.H.	—	—	—	—	—	4
<i>Listerae</i>		1	—	—	—	—	—	—	N. Ireland.
<i>pseudamplexidentatum</i> !		9	—	—	—	—	1	—	Aberdeen.
<i>Bakerianum</i> !		—	—	—	1	—	—	—	Brecon in Wales.
<i>tavense</i>		—	—	—	—	—	1	—	Teesdale.
<i>pycnotrichum</i>	Scandinavia	—	—	—	1	—	—	—	Brecon.
<i>maritimum</i>		6	O.H.	—	—	—	—	—	Yorks.
<i>obesifolium</i>		1	Sh.	—	—	—	—	—	1
		—	—	—	—	—	—	—	Donegal in Ireland.
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Sect. <i>Umbellatu</i>									
<i>umbellatum</i> !	Europe, etc.	8	—	5	10	18	10	17	11
<i>ogweni</i> !		—	—	—	—	—	1	—	—
<i>bichlorophyllum</i> !		—	—	—	—	1	9	5	5
		—	—	—	—	—	—	—	Carnarvon.
		—	—	—	—	—	—	—	W. Midlands.
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Sect. <i>Sabauda</i>									
<i>Bladonii</i> !	Central Europe	3	—	4	6	14	4	12	5
<i>perpropinquum</i> !	Central Europe	—	—	—	1	11	1	10	—
<i>argutifolium</i>		—	—	—	—	—	2	—	—
<i>eminentiforme</i> !		—	—	—	—	—	1	2	—
<i>virgultorum</i> !	Central Europe	—	—	—	—	1	—	4	—
<i>rigens</i> !	Central Europe	—	—	—	—	5	1	6	—
<i>vagum</i> !	Central Europe	2	—	2	12	12	10	—	—
<i>sublactucaceum</i> !	Central Europe	1	—	—	—	1	3	—	—
<i>calvatum</i>		—	—	—	—	—	3	—	—
<i>croceostylum</i> !		—	—	—	—	—	2	—	—
<i>subquercetorum</i>		—	—	—	1	—	—	—	—
		—	—	—	—	—	—	—	[Carnarvon.
		—	—	—	—	—	—	—	Merioneth and

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EXPLANATION OF THE PLATES.

[All drawings, half natural size.]

- PLATE 1. a. *Hieracium speluncarum*. From cult. pl. (orig. Clifton).
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- PLATE 2. a. *Hieracium senescens*. From spec. from Ben Nevis.
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- PLATE 9. a. *Hieracium vulgatum*. From spec. from Bettws-y-Coed.
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- PLATE 14. a. *Hieracium umbellatum*. From pl. from Raynes Park.
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- PLATE 16. a. *Hieracium hibernicum* var. *vennicnorum*. Type spec. in Hb. Dublin. Moyne River about 2 miles above Laghy, Donegal (Hart).
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ERRATA.

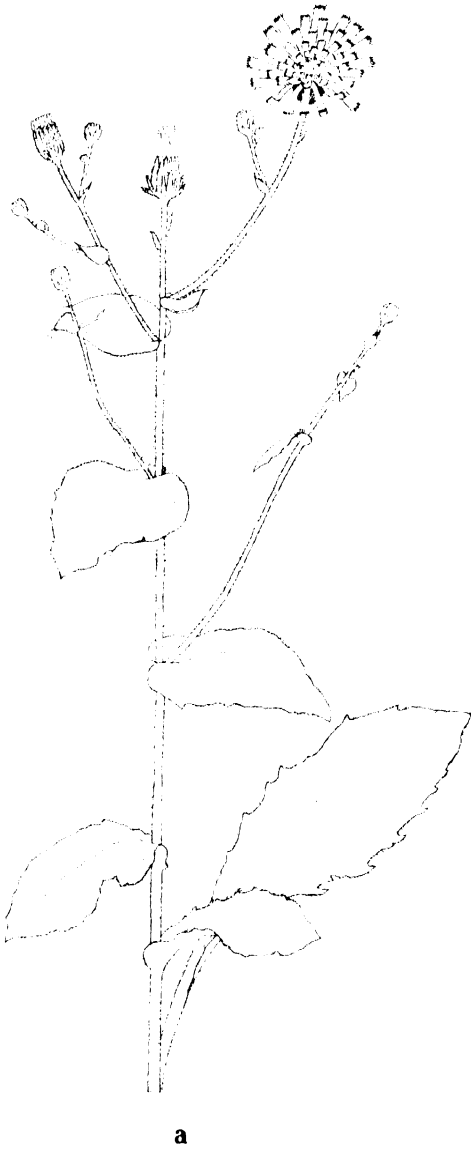
Page 88, lines 15 and 10 from bottom, read *pseudo-Leyi*.

Page 124, line 19 from bottom, read *pseudo-Stenstroemii*.

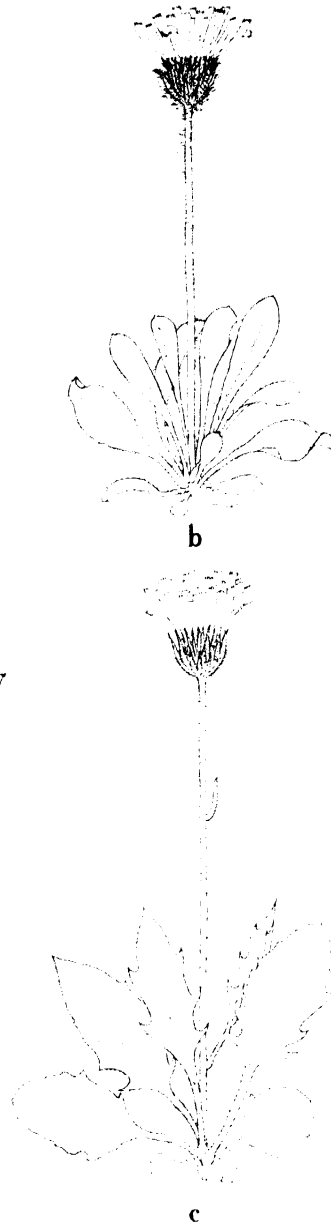
Page 136, line 7 from top, read *pseudo-Stenstroemii*.

Page 152, line 6 from bottom, read *pseudo-Stenstroemii*.

Page 153, line 1, read PSEUDO-STENSTROEMII.



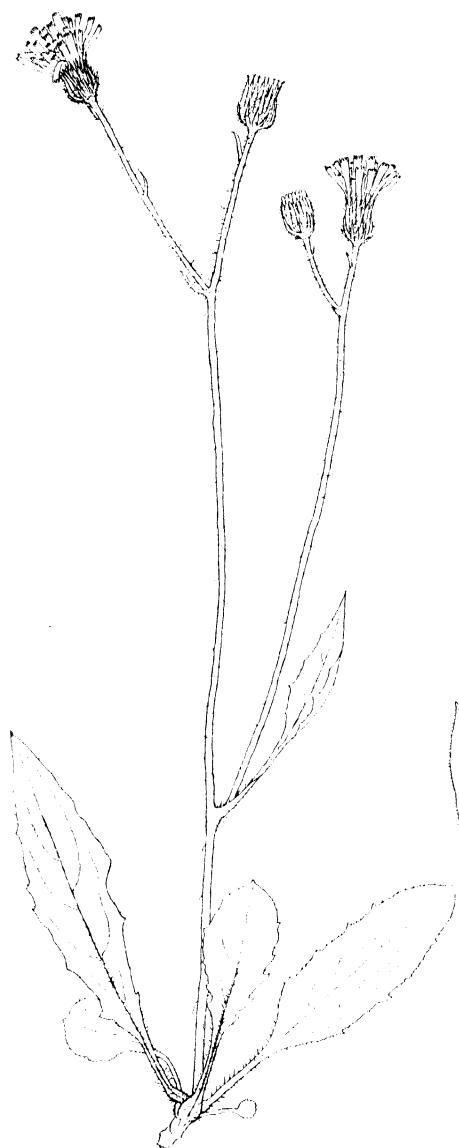
(a) *HIERACIUM SPELUNCARUM*.



(b) *H. HOLOSERICEUM*.

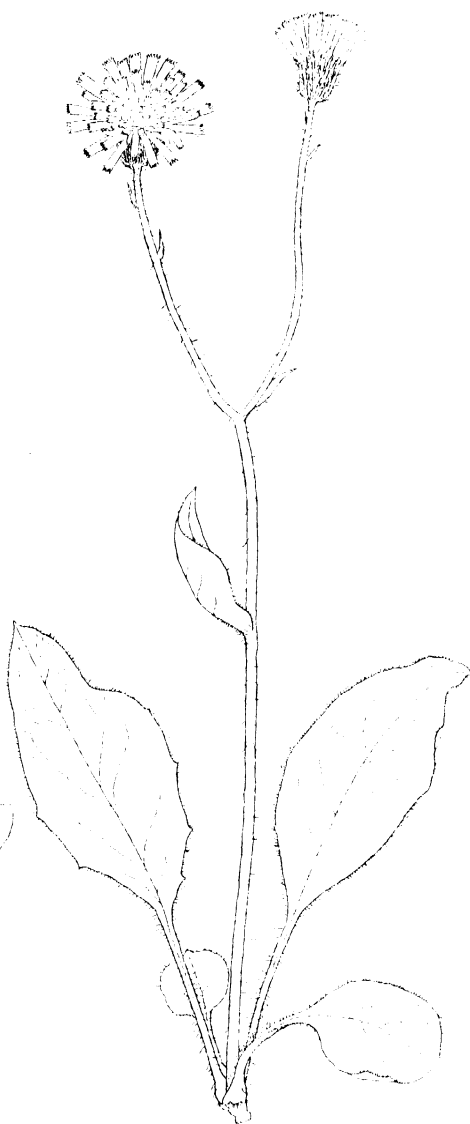
(c) *H. HANBURYI*.

Half nat. size.



a

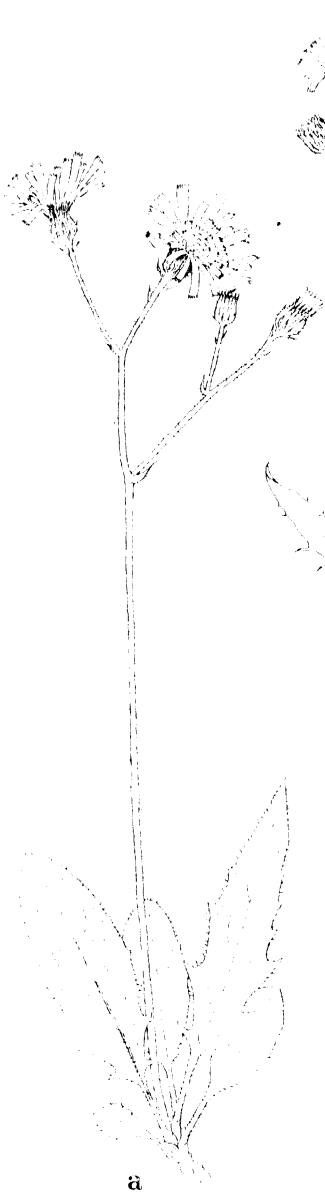
(a) *HIERACIUM SENESCENS*.



b

(b) *H. ANGLICUM*.

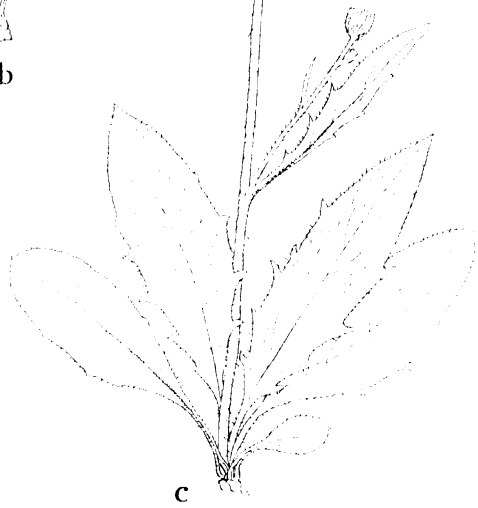
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(a) *HIERACIUM LEYL.*

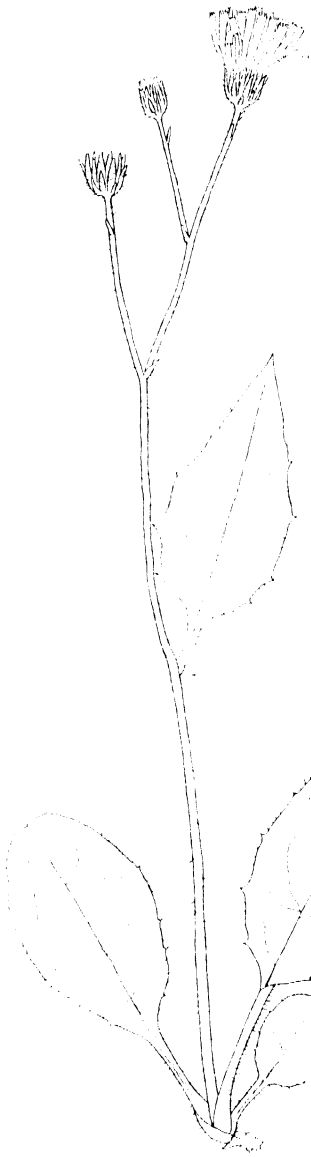


(b) *H. CAMBRICUM.*



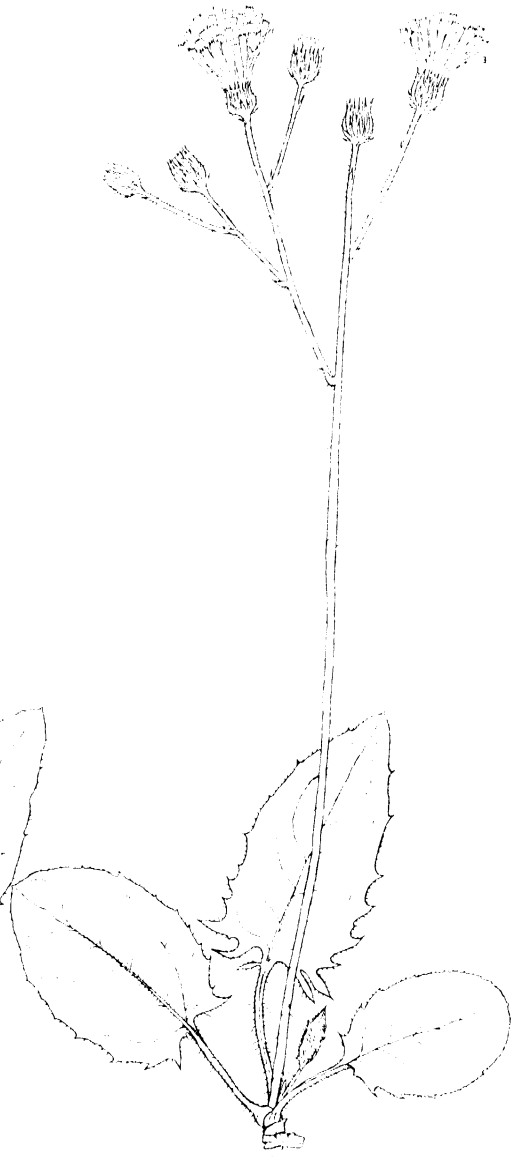
(c) *H. DEGANWYENSE.*

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a

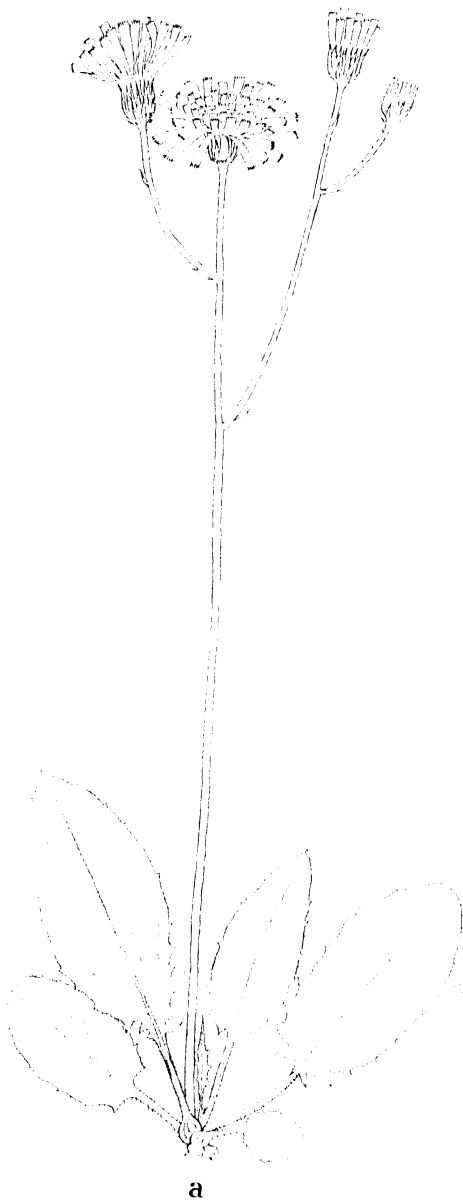
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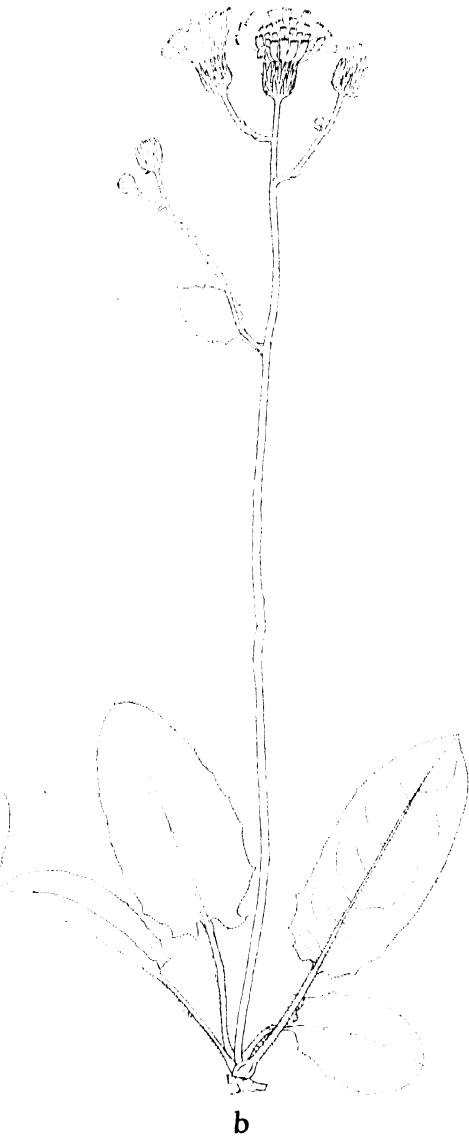
b

(b) *H. BRITANNICUM*

Half nat. size.



(a) *HIERACIUM SUBCYANEUM*.



(b) *H. CYMBIFOLIUM*.

Half nat. size.



(a) *HIERACIUM PRAECOX*.

(b) *H. PELLUCIDUM*.

Half nat. size.



(a) *HIERACIUM AURATIFLORUM*.

(b) *H. EUPREPES*.

Half nat. size.



a
(a) *HIERACIUM CAESIOMURORUM.*

b
(b) *H. DECOLOR.*

Half nat. size.



a

(a) *HIERACIUM VULGATUM*.



b

(b) *H. LACHENALII*.

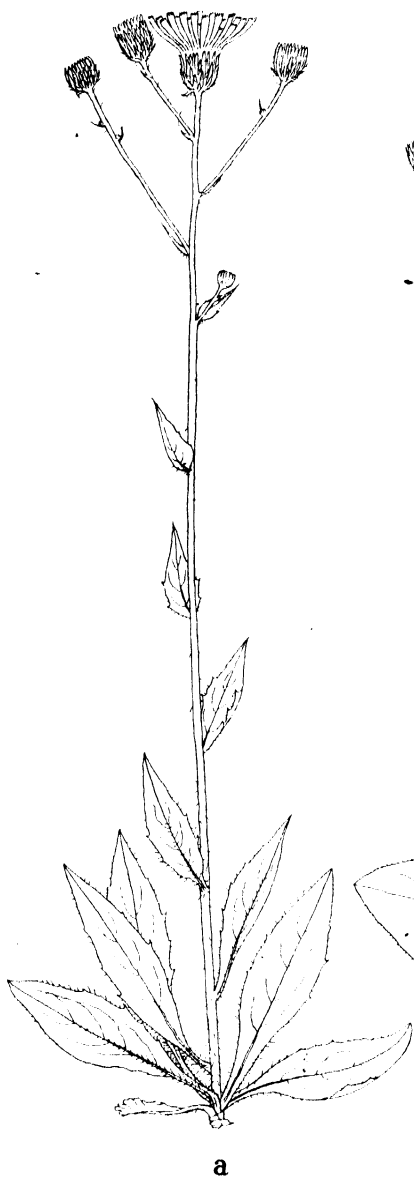
Half nat. size.



(a) *HIERACIUM PSEUDO-PROTRACTUM*.

(b) *H. PRENANTHOIDES*.

Half nat. size.



a
(a) *HIERACIUM GOTHICOIDES*.



b
(b) *H. SCULLYI*.

Half nat. size.



(a) *HIERACIUM PLACEROPHYLLOIDES*.

(b) *H. TRIDENTATUM*.

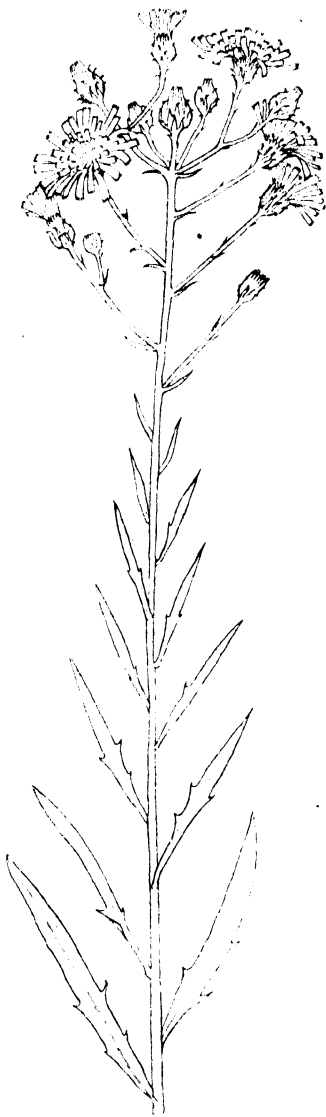
Half nat. size.



(a) *HIERACIUM LATOBRIGORUM*.

(b) *H. STRICTIFORME*.

Half nat. size.



a

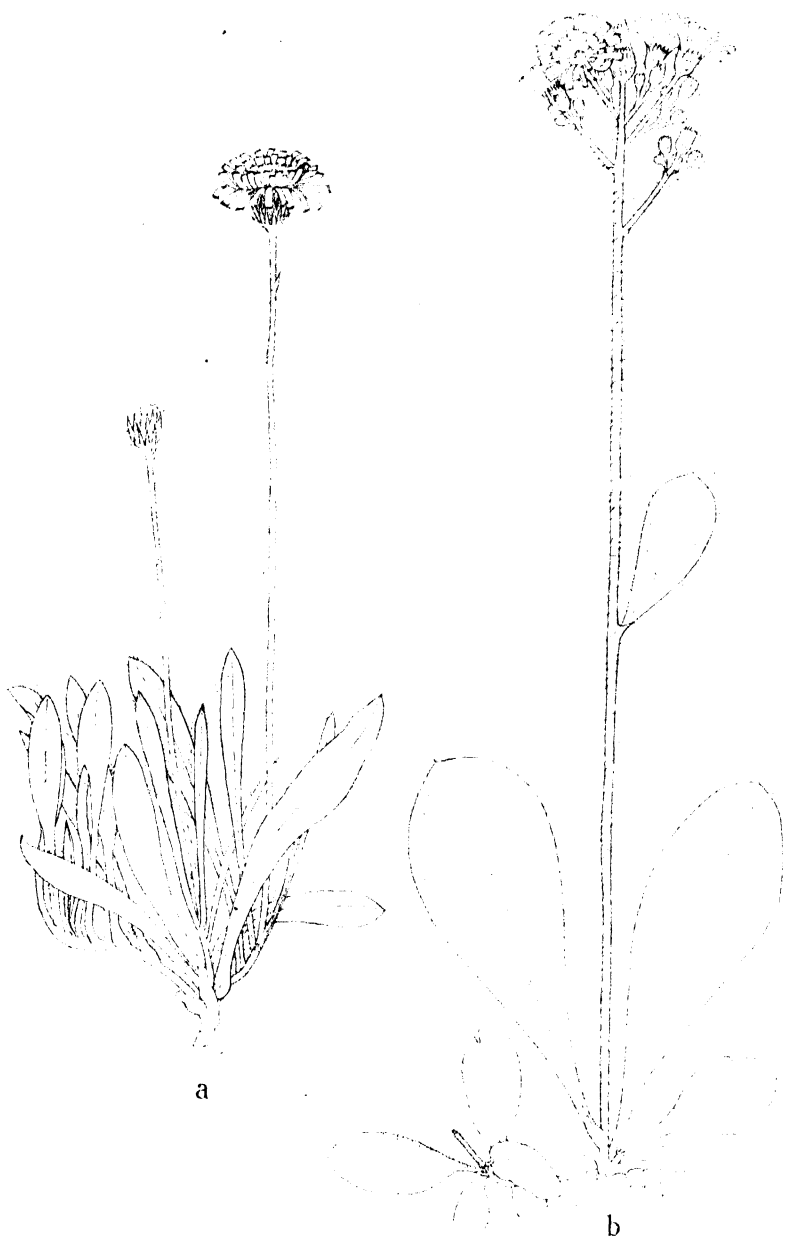
(a) *HIERACIUM UMBELLATUM*.



b

(b) *H. PERPROPINQUUM*.

Half nat. size.



(a) *HIERACIUM PELETERIANUM* VAR. *TENUISCAPUM*.

(b) *H. AURANTIACUM*.

Half nat. size.



(a) *HIERACIUM HIBERNICUM* VAR. *VENNICIORUM*



(b) *H. ÁRDARICUM*.

Half nat. size



HIERACIUM STEWARTII VAR. PRAEGERI.

Half nat. size

I. A. R. I. 75.

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